The Johns Hopkins University

# A History of the Association Psychology from Hartley to Lewes

DISSERTATION

SUBMITTED TO THE BOARD OF UNIVERSITY STUDIES OF THE JOHNS HOPKINS UNIVERSITY IN CONFORMITY WITH THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

R. UNIV. BIBLIOTHEEK LEIDEN

March 1917

HOWARD C. WARREN

Baltimore, Md.
1921

COPYRIGHT 1921 BY
CHARLES SCRIBNER'S SONS

## CONTENTS


| | PAGE |
|---|---|
| ACKNOWLEDGMENTS | iv |
| SOURCE BOOKS | 1 |
| I. DAVID HARTLEY AND THE EARLIER ASSOCIATIONISTS | 6 |
| II. JAMES MILL AND THE LATER ASSOCIATIONISTS | 37 |
| III. EVOLUTIONARY ASSOCIATIONISM | 74 |
| IV. SUMMARY OF ENGLISH ASSOCIATIONISM | 110 |
| BIBLIOGRAPHY | 137 |
| VITA | 141 |

## ACKNOWLEDGMENTS

THE writer gratefully acknowledges the assistance of Professor John B. Watson, director of the Psychological Laboratory of the Johns Hopkins University, and of Professor Knight Dunlap, Associate Professor of Psychology at the Johns Hopkins University. He wishes also to acknowledge the assistance of his former colleague at Princeton University, Professor James Mark Baldwin, at whose suggestion this study was originally undertaken.

The most thorough treatment of associationism from the historian's standpoint, singularly enough, is by an Italian and is written in French. 'La psychologie de l'association,' by Luigi Ferri (1883), gives a very adequate and balanced presentation of the movement in Britain from Hobbes to Spencer. In Ferri's summary of the precursors of the school there is rather too little of Hobbes and too much of Berkeley. One may deem his treatment of James Mill too brief as compared with the emphasis laid on J. S. Mill and Bain. These are in the main attributable to the author's personal equation.

Not so defensible is his dismissal of Lewes in a brief paragraph, as a broad-minded follower of Spencer, "who did not devote his attention specially to the association doctrine, which he nevertheless accepts as a part of the more general doctrine of experience, together with evolution, which extends it indefinitely."[1] Apart from this single instance his perspective is well drawn, and his portrayal of the main features of each writer is good.

About one-third of the book is devoted to a critical estimate of the theory, and this part is particularly worthy of careful examination. Ferri's work is designedly limited to British writers, with only passing references to others; an exception is made, possibly from some national sentiment, in favor of the Italian writer Zanotti. This book has been of more assistance to the present writer than any other single work.

Another very complete history of associationism is found in 'La psychologie anglaise contemporaine,' by Th. Ribot (1870),[2] which covers the movement from Hartley to Lewes in a very adequate manner. As a history of *Associationism* (which it does not claim to be) its chief defect is the omission of writers prior to Hartley,

[1] P. 217.

[2] Revised 1875 and 1892; also Engl. trans.

the total neglect of Thomas Brown, and the inadequate discussion of Lewes.

These deficiencies are all easily explained. Lewes's chief works had not appeared when the volume was first published; Brown, on account of his affiliations with the Scottish school, did not seem to the author to belong among English writers; and, since Ribot's object was to portray merely the *contemporary* status of English psychology, Hobbes and his successors down to Hume appeared too remotely connected with the present-day situation to be noticed. Ribot's redundancy in other places may be explained on the same grounds. The less important and outlying doctrines of the writers from James Mill onward are given at greater length than would be desirable were the book concerned with the association problem alone.

Ribot's work has an advantage over Ferri's as a history, in that his own leaning toward associationism enables him to treat the writers of the school with more sympathetic insight.[1]

No general history of associationism has been written in Great Britain or America so complete and impartial as either of these, though numerous briefer surveys of the movement have appeared and many books and magazine articles dealing with special periods and writers. Only those of most importance from the historical standpoint need be mentioned.

The article on 'Association of Ideas' in the *Encyclopedia Britannica, Ninth Edition,* written by G. Croom Robertson, though far briefer than Ferri or Ribot, is

[1] This is a real advantage only when combined with the historical instinct, as is the case with Ribot. Lewes's 'History of Philosophy' exhibits the disadvantages which may attend such agreement—it serves as an excuse for criticizing at length the minor points of difference between the historian and the authors examined. In the present work *personal* criticisms are confined to the footnotes; the criticisms in the text are based on the *general* consensus of associationism.

perhaps the most adequate treatment of the association movement as a whole and the principles for which it stands. It covers the field from Aristotle down to Spencer thoroughly, with not a sentence of irrelevant matter. Lewes is omitted, possibly because the article was written before his chief work (the 'Problems') appeared. The synopsis and critique of the various conceptions of the associative principles contained in this article have been of great help to the present writer, especially in the preparation of chapters IX and X. The article is reprinted in Robertson's 'Philosophical Remains.'[1]

In the *Britannica, Eleventh Edition,* the same article appears in somewhat condensed form, with a new section on recent criticisms of the school. The original article is preferable. Mention should also be made of the special examination of the several associationist writers found in the *Britannica* under their names. Most of these articles are very full and written from a broad standpoint; Bain and Spencer are missing from the list in the *Ninth Edition,* as they were still living when the work was prepared; they are included in the *Eleventh.*

The treatment in all the other English and American encyclopedias (usually under 'Association of Ideas') is too brief to be of much service, except to outline the doctrine; the same may be said of the articles 'Association of Ideas' and 'Associationism' by G. F. Stout in Baldwin's *Dictionary of Philosophy and Psychology.* The German *Konversations-Lexika* include only brief notices; the French *Grande encyclopédie* has a good summary by Ribot, also rather condensed.

Histories of philosophy by German writers treat the association movement very inadequately, on account of the overshadowing influence of Kant and his school on German thought. Ueberweg's work devotes considerable space to the individual writers, and is a good reference

[1] Pp. 102 ff.

work for this as for other movements. A most satisfactory historical treatment so far as the date of its publication permits is found in 'Speculative Philosophy in the Nineteenth Century,' by J. D. Morell (1846);[1] another satisfactory discussion appears in the 'Histoire de la philosophie, les problèmes et les écoles,' by Paul Janet and Gabriel Séailles (1887-8).[2] G. H. Lewes's 'History of Philosophy' (1845-6)[3] takes a sympathetic attitude but is quite inadequate as a view of the whole movement, though the treatment of Hartley is exceptionally good; Brown and James Mill are omitted altogether, and the later writers are only referred to briefly.[4]

The precursory period, from Aristotle to Hobbes, is covered exhaustively in an essay by Sir William Hamilton, appended as a Note to his edition of Reid's 'Works.' This is based on an earlier work by J. G. E. Maass,[5] but contains many independent citations. S. T. Coleridge's essay on the early phase of associationism in his 'Bibliographia Literaria' (1847) in quite untrustworthy. Victor Cousin's 'Philosophie sensationiste de la 18e siècle' is especially good in its treatment of Hobbes.

'David Hartley and James Mill,' by G. S. Bower (1881) gives an excellent summary of the association theory of these two writers, with some discussion of the younger Mill and of Spencer. While numerous magazine articles have appeared on the latest phase of associationism,[6] and several important works have been written

[1] Revised 1858.

[2] Engl. trans. 1902.

[3] Several revisions to 1880.

[4] See Bibliography at end of this volume for other histories which are helpful in their discussion of specific periods or writers. Robert Blakey's treatment of Hartley and the other earlier writers, in his 'History of the Philosophy of Mind' (1848), Vol. III, may be cited as an excellent specimen in every respect of what an historical review should *not* be.

[5] Hamilton refers to this as Maass's 'Beytraege' (1792). I am unable to find the work.

[6] See Bibliography.

from a controversial standpoint, there is nothing to be specially recommended which covers the history of this period.

Interesting reviews of the experimental investigation of association, which has recently become prominent, and its relation to the older doctrine, are to be found in 'L'Association des idées,' by E. Claparède (1902), the 'Essai critique et théorique sur l'association en psychologie,' by Paul Sollier (1907), and 'The Psychology of Association,' by Felix Arnold (1906).

# CHAPTER I

## DAVID HARTLEY AND THE EARLIER ASSOCIATIONISTS

### *1. Hartley's General Standpoint*

DAVID HARTLEY (1705-1757) was a contemporary of Hume and began his work on association before the publication of Hume's philosophical writings. Like Locke he was a physician and well versed in several sciences. His chief work, the 'Observations on Man, his Frame, his Duty, and his Expectations,' appeared in 1749, ten years after the 'Treatise' and one year after the 'Enquiry' of Hume. But according to the preface he had been for about eighteen years considering the power of association, having been led to do so first by hearing of Gay's theory, and later by reading the 'Dissertation' itself. Prior to the 'Observations,' he published anonymously a short treatise in Latin, entitled 'Conjecturae quaedam de sensu, motu, et idearum generatione,' giving in concise form a psychological analysis based on association.[1]

The two fundamental points in Hartley's theory of mind are (1) his attempt to trace a close correspondence between mental and neural activity in terms of vibra-

[1] The 'Conjecturae' appeared without date, and there is no direct evidence fixing the year, which is believed to be 1731. Its 22 propositions and many of the corollaries and cases are stated in almost equivalent language with the first portion of the 'Observations,' so there can be no question of the authorship; but the discussion in the 'Conjecturae' is much briefer. Citations are from the reprint by Parr (*Metaphysical Tracts*) of the 'Conjecturae,' and from the fourth edition of the 'Observations,' London, 1801.

tions,[1] and (2) his elaboration of all experience according to the principles of association. Hartley's doctrine of vibrations, though it suggests certain modern theories of psychological parallelism, was not their direct precursor. The modes of neural activity were so little known in Hartley's time that it would be difficult to restate his doctrine in modern physiological terms. Even Joseph Priestley, the disciple and editor of Hartley, who upheld most of his other views, omitted the passages referring to the vibration theory in his abridged edition of the 'Observations.' But Hartley's theory of association, itself a natural development of the earlier attempts, was widely noticed and became the starting-point for later developments of the association psychology.

The 'Observations on Man' is divided into two parts, the first comprising Hartley's psychology ("observations on the frame of the human body and mind"), the second his ethics and theology ("observations on the duty and expectations of mankind"). Only the former concerns us here. The work consists of a series of propositions, demonstrations, and corollaries—a literary form suggestive of Spinoza, and rather surprising in a treatise so thoroughly grounded on empiricism.

Hartley starts by dividing man into body and mind. Body is subject to investigations of the same sort "as the other parts of the external material world." Mind is "that substance, agent, principle, etc., to which we refer the sensations, ideas, pleasures, pains, and voluntary motions."[2] He divides experience, or 'internal feelings,' into sensations and ideas. "Sensations are those internal feelings of the mind which arise from the impressions made by external objects upon the several parts of our

[1] Compare Aristotle's use of *κίνησις* in both a physical and a mental sense, p. 26.

[2] 'Obs.,' Pt. I, introd.

bodies.[1] All our other internal feelings may be called ideas." "The ideas which resemble sensations are called ideas of sensation; all the rest may therefore be called intellectual ideas;" and he proposes to show that "the ideas of sensation are the elements of which all the rest are compounded." Pleasures and pains are either sensations or ideas, all experiences being "attended with some degree either of pleasure or pain."[2] Hartley expressly excludes *reflection* as a separate source of ideas, and in this way seeks to make his analysis simpler than Locke's.

In addition to the elements of experience (sensations and ideas), he assumes that the human mind is endowed with certain faculties, namely, "memory, imagination or fancy, understanding, affection, and will,"[3] by means of which the elements are transformed. One must also consider the motor phenomena of the body in connection with mental experience. The motions of the body, he says, are of two kinds, automatic and voluntary; the former "are those which arise from the mechanism of the body in an evident manner," while the latter are "those which arise from ideas and affections, and which therefore are referred to the mind."[4] He proposes, then, (1) to lay down the general laws "according to which the sensations and motions are performed" and "ideas generated"; (2) to apply these laws in turn to each sort of sensation and motion; and (3) to apply them further to the genesis of each particular sort of idea, such as memory, imagination, etc. A fourth problem, which does not concern us here, is to furnish a history and analysis of the different classes of pleasures and pains.[5]

Sensations, according to Hartley, are due to vibrations in the small particles of white medullary substance of the

[1] Note the advance over Hume in this distinction between the physical impressions or stimuli and the resulting sensations.
[2] Introd. [3] *Ibid.* [4] *Ibid.* [5] *Ibid.*

brain, spinal cord, and nerves, occasioned by "external objects impressed upon the senses." [1] But these vibrations are of a corporeal nature, while sensations and ideas are of a mental nature; and it is impossible, he affirms, to discover in what way the former 'cause or are connected with' the latter—a statement which distinctly repudiates the materialistic standpoint.

The genesis of ideas is attributed to the fact that "sensations, by being often repeated, leave certain vestiges, types, or images of themselves"; [2] and that sensory vibrations beget in the brain substance "a disposition to diminutive vibrations . . . corresponding to themselves." [3] These *dispositions* are the physical basis of ideas, and the ideas themselves occur and recur as the vestiges are stimulated and set in vibration. Ideas thus formed are called simple ideas of sensation, though they "are not entirely simple, since they must consist of parts, both coexistent and successive, as the generating sensations themselves do." [4] The intellectual ideas are complex to a greater degree.

### 2. *Hartley's Conception of Association*

This brings Hartley to the law of association. "Any sensations, *A*, *B*, *C*, etc., by being associated with one another a sufficient number of times, get such a power over the corresponding ideas, *a*, *b*, *c*, etc., that any one of the sensations, *A*, when impressed alone, shall be able to excite in the mind *b*, *c*, etc., the ideas of the rest." [5] The succession of sensations is due solely to the order of sense impressions, and is not included in the law: a sensation *A*, however frequently it has occurred in connection with another sensation *B*, does not recall the latter, but only the corresponding idea *b*. But an idea (like a

[1] Prop. IV. [2] Prop. VIII. [3] Prop. IX.
[4] Prop. VIII. [5] Prop. X.

sensation) may serve to recall an idea; thus if a number of ideas, *a, b, c, d,* etc., have occurred often together, then the recurrence of one of these, such as *a,* "will frequently bring in all the rest, *b, c, d,* etc., and so associate all of them together still farther." [1]

Similarly, he finds that association includes 'muscular motions' in the same way as ideas and sensations, and finally generalizes his law so as to include all three phenomena: "If any sensation *A,* idea *B* [*b*], or muscular motion *C* [$\gamma$], be associated for a sufficient number of times with any other sensation *D,* idea *E* [*e*], or muscular motion *F* [$\varphi$], it will at last excite *d,* the simple idea belonging to the sensation *D,* or the very idea *E* [*e*], or the very muscular motion *F* [$\varphi$]; " [2] it cannot by association "excite the real sensation *D,* because the impression of the sensible object is necessary for this purpose." [3]

This is the law of successive association. Hartley finds that it can be extended to include simultaneous association of complex experiences also. Thus, if a sensation *A* be associated at different times with different sensations *B, C, D,* etc., one at a time, then *A* will at last be able to raise their ideas, *b, c, d,* etc., all together,—unless, indeed, they belong to the same region of the brain, in which case, he says, "*A* will raise up something intermediate between them." Again, if a compound idea, $a + b + c + d$, due originally to a compound impression, $A + B + C + D$, be called up in any way, its parts, by the fact of their being repeated together, tend to be still more closely associated. "Simple ideas of sensation must run into clusters and combinations by association,

[1] Prop. XII, 5.

[2] Prop. XX, cor. 7. The lower case letters in brackets represent ideational elements, and Greek letters represent muscular equivalents; these should be substituted to carry out consistently the symbolism which Hartley himself suggests.

[3] *Ibid.*

and these will at last coalesce into one complex idea, by the approach and commixture of the several compounding parts; . . . many of our intellectual ideas . . . are in fact thus composed of parts, which by degrees coalesce into one complex idea." [1] "As simple ideas run into complex ones, by association, so complex ideas run into *decomplex* ones by the same; but the union in the latter case is not so close and permanent." [2]

According to Hartley, then, the sole basis of association is contiguity; and he limits it to contiguity in time. Sensations must be simultaneous or in immediate succession in order that one may bring up the idea of the other; ideas must have occurred together or in close succession in order that one may bring up one or all of the others. His view seems to be that contiguity in space is no part of the mental law: if spatially contiguous objects are more likely to be sensed at the same time or successively than objects which lie far apart, this is a physical phenomenon; whether the objects be distant or adjacent, it is the simultaneity or succession of their impressions that leads to the association, not their space relation.

Hartley ignores the law of resemblance altogether. The only resemblance which he recognizes is that between the sensation and its corresponding idea. An idea does not recall *similar* ideas, but the *same* idea is repeated, and with it are associated others formerly experienced *contiguously;* a sensation recalls only its corresponding idea (the faint copy of itself), or ideas contiguously related to it in the past. Hartley is able to do without the law of resemblance because he believes that complex sensations and ideas are resolvable into simpler elements, and that these elements are actually repeated. What we generally call the resemblance of one experience to another is for him only the presence of certain identical simple elements in two complex experiences.

[1] Prop. XII, cases 1, 4, 5. [2] *Ibid.*, cor. 4.

On the other hand the function of habit plays an important part in his analysis of the associative process. Experiences, whether sensations or ideas or a group including both, when they have been frequently associated together tend to recall one another more readily; and a group of simultaneous experiences, by frequent recurrence as an associated group, tend to a firmer union, and at length become a single complex experience. Habit or repetition, then, tends to strengthen any union founded on contiguity of experience, and makes the succession more ready and the grouping more unitary.

Hartley broadens the conception of association by including the motor side in his discussion. He holds that muscular movements form associations of the same sort as the associations between ideas, so that the recurrence of one tends to reinstate others which formerly succeeded it. And he extends this notion so as to cover a general association between sensations, ideas, and movements: the recurrence of a movement may recall an idea formerly associated with it; or the recurrence of a sensation or idea may bring about the repetition of a movement.

Thus Hartley is able to formulate his explanation of volition in psychophysical terms. The notion of an association between experiences and human activity permits him to treat conative phenomena in the same way as intellectual and affective phenomena, a possibility which earlier analysis had overlooked. Hume had suggested that habit promotes facility in the performance of any action; but he did not analyze voluntary activity in terms of association, and he seems to have believed the mind capable of imagining and acting freely and arbitrarily apart from the force of association.[1]

In Hartley for the first time we find the principle of association stated broadly enough to cover the entire field of human experience and activity. In his subsequent

[1] 'Treat.,' Bk. I, Pt. I, § 4; 'Enq.,' § 8; and elsewhere.

analysis he proceeds to apply this principle to the discovery of elementary mental phenomena, first taking up sensation and resolving apparently simple sensations into more elementary units.

### 3. *Hartley's Applications of the Principle*

Hartley accepts the classical view that the senses are five in number. 'Heat, cold, and pressure,' as well as pain, he considers qualities of the sense of touch, or 'feeling.'[1] Much of his analysis of sensation is concerned with the vibration theory, but the principles of association are applied in accounting for the knowledge of space relations through each sense. Take touch, for instance. "The ends of the fingers give us so much more precise information concerning the tangible qualities of bodies than . . . the ends of the toes" on account of the custom of "rubbing the ends of the fingers against the tangible object";[2] this is the effect of 'practice and habit,' that is, association. Again, in touch "distance is judged of by the quantity of motion, and figure by the relative quantity of distance";[3] we learn "what is the distance of the part touched from the mouth, nose, shoulder, elbow, or any other remarkable part, . . . by passing frequently from the mouth, nose, etc., to the part under consideration";[4] "we shall also, supposing us to have arrived at a sufficient degree of voluntary power over the muscles, be able at once to put our hand upon the part on which the impression is made";[5] an application of the motor aspect of the associative law. In sight "we judge of motion by the motion of the pictures on the retina, or of our eyes in following the objects";[6] position is judged by the part of the retina on which the stimulus falls.

[1] Prop. XXIII. [2] *Ibid.* [3] Prop. XXX.
[4] Prop. XXXI. [5] *Ibid.* [6] Prop. LVIII.

Visual size and distance are determined chiefly by the picture on the retina being larger when the magnitude, in terms of touch, is the same, etc.; but he specifies five 'associated circumstances' which at times influence the judgment: "the number of objects which intervene, the degree of distinctness in which the minute parts are seen, the degree of brightness, the inclination of the optic axes [convergence], and the conformation of the eye [accommodation]."[1] Hearing gives us little notion of distance, except in visual terms.[2]

Hartley finds in each sense certain closely associated elements of pleasures and pain; and in every sensory experience certain ideas are bound up with sensation, so that the portion of the experience contributed by the sense is relatively small.

Passing to complex mental phenomena, Hartley takes a broader view than Locke, Berkeley, or Hume. The chief concern of these writers being epistemological, they deal mainly with intellectual phenomena, while Hartley constantly introduces the motor side, both voluntary and involuntary, and devotes much attention to the analysis of the affective consciousness.

The association of ideas with words is a fundamental operation in man, according to Hartley; and this is the first type which he examines. "Words and phrases," he says, "must excite ideas in us by association," and by this means alone.[3] Words may be considered "(1) as impressions made upon the ear; (2) as the actions of the organs of speech; (3) as impressions made upon the eye by characters; (4) as the actions of the hand in writing."[4] Their use is learned in the order named. From an early age, "many sensible impressions and internal feelings are associated with particular words and phrases, so as to give these the power of raising the cor-

[1] *Ibid.*
[2] Prop. LXVI.
[3] Prop. LXXIX.
[4] *Ibid.*

responding ideas." Thus, the name of a visible object —for instance, the child's nurse—" is pronounced and repeated by the attendants to the child more frequently when his eye is fixed upon the nurse than when upon other objects. . . . The association, therefore, of the sound *nurse* with the picture of the nurse upon the retina will be stronger than that with any other visible impression, and thus overpower all the other accidental associations." [1] The association is made more definite by changes in the 'non-essentials' of the object, as when the nurse appears in different surroundings, different dress, etc.; these conflicting associations tend to neutralize one another and strengthen the main association with the word. The other sorts of words, the speech-motor, visual, and hand-motor, fix and extend the " ideas and significance of words and phrases by new associations." [2]

This genetic analysis has a very modern flavor. In another place he points out the results of repeated verbal associations with objects; in the end the connection becomes so strong that when the sensations of the objects are felt, " they lead by association to the words expressing them, and thus we can distinguish " qualities " and declare in words what each is." [3]

The two phases of belief, assent and dissent, he defines as " those very complex internal feelings which adhere by association to such clusters of words as are called *propositions*." [4] Rational assent to any proposition is " a readiness to affirm it to be true, proceeding from a close association of the ideas suggested by the proposition, with the idea . . . belonging to the word *truth*"; while " practical assent is a readiness to act in such a manner as the frequent vivid recurrency of the rational assent disposes us to act." [5]

[1] Prop. LXXX. [2] Prop. LXXIX. [3] Prop. XXXIV.
[4] Prop. LXXXVI. [5] *Ibid.*

Passing on to the emotions or passions, Hartley declares them to be merely "aggregates of simple ideas united by association"; their constituent ideas are "traces of the sensible pleasures and pains" which "make up by their number and mutual influence upon one another for the faintness and transitory nature of each singly taken."[1] The will itself is only "a desire or aversion sufficiently strong to produce an action that is not automatic." It follows from this that the will is 'mechanical,' if we understand this term to include that which takes place by association.[2]

It is at this point that Hartley takes up the analysis of memory and imagination. When we consider that not only Aristotle but all of Hartley's forebears made use chiefly of memory to expound and illustrate the principles of association, the lateness of its appearance in Hartley's exposition is striking. The reason seems to be that while he has hitherto been discussing ideas as faint copies of sensations, he is now led to consider the concrete complex experiences which constitute actual recollections.

Memory is "that faculty by which traces of sensations and ideas recur, or are recalled, in the same order and proportion, accurately or nearly, as they were once presented."[3] The special problem is, how we can recollect accurately a very complex experience, say of 1000 particulars, fitting each memory image into its proper place. Hartley supposes the elementary facts to be impressed first, so that the child, for instance, will recall a mass of detached circumstances; gradually, by repetition of 'clusters' of sensations, the memory is extended to clusters and chains of ideas, and in the same way these groups come to be associated by repetition, and so united in memory. The growth of memory is aided by verbal associations; and certain associations—wrong ones—are

[1] Prop. LXXXIX. [2] *Ibid.* [3] Prop. XC.

prevented by " ideas of inconsistency, impossibility, and by methods of reasoning." [1] We distinguish a memory from an imagination partly by the greater vividness of the clusters of ideas which make up the former, but principally by " the readiness and strength of the associations by which they are cemented together." [2] And similarly we distinguish a remembered sensation (one which we know we have had before) from a new one by the fact that " the parts, associates, etc., of that which we remember strike us more strongly, are suggested by each other, and hang together, which does not hold of the new." [3] So too, a lessened vividness of memory suggests to us a greater lapse of time since the original impression occurred, and *vice versa*—which accounts both for the time reference of memories and for erroneous references in certain cases where the connection is disproportionately strengthened by interest and other influences.

The ' faculty ' of memory thus turns out to be no new form of intuition; it is not a mind within the mind, or an " eye within the eye," to quote Hartley's simile, but only a name for certain distinctive experiences, differentiated by peculiarities of " vividness and connection in the ideas, with the other associates " peculiar to recollection.[4]

Hartley's view of the practical working of voluntary recollection is stated in language not unlike Aristotle's: " When a person desires to recollect a thing that has escaped him, suppose the name of a person or visible object, he recalls the visible idea, or some other associate, again and again, by a voluntary power, the desire generally magnifying all the ideas and associations, and thus bringing in the association and idea wanted at last. How-

[1] *Ibid.* [2] *Ibid.* [3] *Ibid.*

[4] *Ibid.* It is interesting to note the counter-criticism from an opposing standpoint, that there is no such " faculty as *association* at all: it is only *memory* with a new name " (Blakey, ' History of the Philos. of Mind,' Vol. III, p. 287).

ever, if the desire be great, it changes the state of the brain and has an opposite effect, so that the desired idea does not recur till all has subsided—perhaps not even then." [1] He takes pains to declare that the *voluntary power* here mentioned is "of the nature of memory,"—that is, voluntary recollection proceeds according to the same principles of association; and in fact, "the whole powers of the soul may be referred to the memory, when taken in a large sense," [2] namely, as an ideal copy of sensation.

Imagination, or fancy, is "the recurrence of ideas, especially visible and audible ones, in a vivid manner, but without any regard to the order observed in past facts." [3] "Every succeeding thought is the result either of some new impression or of an association with the preceding; " [4] so that the laws of association hold for the imagination, except where a new sense impression interrupts the flow. Dreams, which he analyzes at considerable length, are deducible from impressions and ideas, generally those recently received, and from their sequence according to associative principles; they are also dependent upon impressions due to the present "state of the body, particularly of the stomach and the brain." [5] The dreamer supposes his dream states to be real, that is, to be actual sensations, because he has no other reality to compare them with; for this reason, and because of "the increased heat of the brain" in sleep, dream experiences are more vivid than the ideas of our waking life. We do not notice their inconsistencies, because the associations which would lead us in waking life to observe them are here excluded, and moreover we pass very rapidly from one thing to another.

[1] *Ibid.*, obs. 10. [2] Obs. 11, 12. [3] Prop. XCI.
[4] *Ibid.* [5] *Ibid.*

### 4. *Deficiencies in Hartley's System*

Strangely enough, Hartley does not follow up his discussion of imagination and dreams with any specific analysis of the 'understanding' in its highest manifestation, namely, reasoning. Instead he proceeds to consider abnormalities of reason and the intellect of the lower animals, and this completes his survey, except for a final chapter, which contains an over-minute analysis of intellectual pleasures and pains.[1] The discussion of assent and dissent, already mentioned, takes us through judgment and belief. One would expect from so acute a thinker as Hartley some treatment of the relation between trains of imagination and trains of reasoning, if nothing more; and this we do not find anywhere. The relation between reasoning and other ideational trains is a vital point in the empirical psychology, and serves more than anything else to separate it from the rational school; the failure to analyze reasoning is probably the greatest defect in Hartley's work, regarded from his own standpoint.

Hartley's discussion of volition, though more adequate than that of his predecessors, is scattered about in various places and is nowhere brought together in a summary. But against this deficiency must be set the fact that the will is brought into vital relation with muscular activity in general, and that the motor theory is worked out along associational lines for the first time. Hartley's treatment of sensory pleasures and pains is too brief and fragmentary to be satisfactory, especially when contrasted with his minute analysis of ideational pleasures and pains. There is also a certain artificiality in his analysis of memory: he assumes that all the elementary experiences must be learned first, before we can begin to recall groups of events and successive experiences. This view could scarcely satisfy those who repeated the analysis from the

[1] Ch. 4.

same associational point of view. At times also Hartley's attention is arrested by rather superficial associations, and he attempts to explain important phenomena in terms of these, instead of probing deeper. His theory of the origin of shame [1] is an instance of this.

Without ignoring these and other failures and unevennesses in Hartley's analysis, we should give full credit to his work for its tremendous advance over all his predecessors. His is the first attempt at a consistent and exhaustive application of association to all experience and activity. He aims to explain our entire mental life in terms of the fusion and succession of elementary experiences. The sole data used are sensations and their ideational replica. A single principle serves to account for the transformation of these elements into higher complexes and the transition from one conscious state to the next.

### *5. Other XVIIIth Century Associationists*

For about seventy years after the publication of Hartley's 'Observations' there was only one attempt at a thorough analysis of consciousness on the basis of association. But the influence of his work and of the earlier formulations of the theory was manifest in many directions. Thomas Reid and other writers of the Scottish movement, while they combated associationism as a doctrine, nevertheless paid due regard in their psychology to the laws of the association of ideas as formulated by Hume and Hartley. More notable was the influence of the theory upon a number of thinkers who applied the associative principles to the analysis of special topics. Among these writers, Tucker, Priestley, Alison, and Erasmus Darwin deserve special mention.

A larger group tacitly assume the results of the associational analysis or show its influence in their work.

[1] Prop. LXXIII.

The utilitarian doctrine, for example, with its empirical development of ethics, springs from the same attitude toward nature as associationism and proceeds upon the same underlying presuppositions. It is beyond the scope of our study to trace the obscure and implicit connections which abound in the literature of that time. Reference should be made, however, to the writings of SMITH, BENTHAM, and the BELSHAMS, who manifest the spirit of the association school in several outlying fields without adding especially to the psychological analysis itself.[1]

ABRAHAM TUCKER (1705-1774), a lawyer, repeats the associational analysis of mind exhaustively, with some new features, in a voluminous work bearing the quaint title 'The Light of Nature Pursued' (1768), which seeks to derive the principles of morality from experimental data. His standpoint is more in agreement with Locke than with Hartley, whom he criticizes particularly for regarding the mind as merely a passive receiver of impressions. Tucker reverts to Locke's position in attributing ideas to reflection as well as sensation.

Association occurs with both classes of ideas. "From ideas thus received by sensation and reflection," he says, "there grows a new stock, framed up of these as of so many materials, by their uniting together in various assemblages and connections."[2] Tucker gives the generic

[1] Adam Smith (1723-1790) in both economics and ethics; see 'The Wealth of Nations' (1776), and 'Theory of Moral Sentiments' (1761). Jeremy Bentham (1748-1832) in jurisprudence and ethics; see especially his 'Principles of Morals and Legislation' (1789), and 'Table of the Springs of Action.' Rev. Thomas Belsham (1750-1829), an ardent admirer of Hartley, in philosophy and ethics. In his 'Elements of the Philosophy of the Mind and of Moral Philosophy' (1801) he endeavors to reduce the basis of association to pleasure (pp. 208-9). His brother, William Belsham (1752-1827), furnishes less systematic contributions in the same field: see his 'Essays, Philosophical and Moral' (1799), especially essays II, X, and XI. See also the anonymous work entitled 'Essay on the Nature and Existence of the Material World,' which appeared in 1781.

[2] Pt. I, ch. 9, art. 1, 2d ed.

name of *combination* to this juncture of ideas, which he says includes two separate modes, *association* and *composition*. Thus Tucker was the first to recognize explicitly the difference between a union without alteration of the components, and the sort of connection wherein the ideas so "melt together as to form one single complex idea."[1] The latter process, composition, or in modern terms *fusion*, was afterwards developed into the theory of mental synthesis or mental chemistry. Tucker's statement of this principle is perhaps his most important contribution to the association theory: "A compound may have properties resulting from the composition which do not belong to the parts singly whereof it consists."[2]

Tucker considers simultaneous combination an earlier manifestation than successive combination. The rise of the latter he attributes to the fact that clusters of simultaneous ideas are generally too large to be taken in by the mind together; thus only a part of the clusters appear at first, but on account of their connection other parts or groups are immediately afterwards called up.[3] There is an 'attraction' between ideas, so that the preceding idea generally determines what associate shall appear;[4] and the association, once formed, cements the ideas together. Ideas bearing reference to some purpose in view tend in this way to appear in regular succession; and such a succession he terms a *train*.[5] "Our trains once well formed, whatever suggests the first link, the rest follow readily of their own accord."[6] As assemblages of ideas form trains, so trains become connected into "courses of thinking."[7] He notes, moreover, that often some of the middle terms of a train fall out as the result of frequent repetition—the doctrine of lapsed links.[8]

Reasoning, according to Tucker, is not a separate

[1] *Ibid.* [2] Ch. 12, art. 1; *cf.* ch. 1, art. 2. [3] Ch. 10, art. 1.
[4] Ch. 9, art. 14. [5] Ch. 10, art. 3. [6] Art. 4.
[7] Art. 1. [8] Art. 13.

faculty, but is the "discerning of the agreement of two ideas between themselves, by their agreement with some third." [1] The mental processes usually attributed to the separate faculties of apprehension, judgment, and ratiocination, he believes, may be completely described in terms of perception,[2] and there are in reality only two modes of perception—imagination and understanding, both of which are "acquired by use and practice, . . . the latter growing out of the former." [3] We need not follow him in his application of this analysis to moral principles.

Joseph Priestley (1733-1804) began his career as a clergyman, but left this calling on account of a change in theological views. He became a student of Hartley's work and a follower of his theories.[4] In 1775 he published an abridged edition of the 'Observations on Man,' to which he prefaced a series of three essays, defending and expounding Hartley's theory of association. In particular he defends the view that sensation is the only source of ideas.[5] He supplements Hartley's analysis by tracing out the elements of a number of very complex ideas, such as the notions of force, time, right and wrong, etc.

Priestley reiterates Tucker's view that mental phenomena are altered by fusion. As color-mixing, he says, produces apparently simple effects of color, so "from the combination of ideas, and especially very dissimilar ones, there may result ideas which, to appearance, shall be so different from the parts of which they really consist, that they shall no more be capable of being analyzed by mental reflection than the idea of white." [6] A whole mass of ideas can so completely grow into one, that they

[1] Ch. 11, art. 13. [2] Art. 36. [3] Ch. 12, art. 1.
[4] Priestley was for many years interested in chemistry, and is noted for having been the first to accomplish the separation of oxygen.
[5] Essay 3. [6] *Ibid.*, 'Misc. Works,' III, p. 190, ed. of 1818.

appear to be only a single idea. Priestley abandoned Hartley's vibration theory; but on the other hand he assumes that mental phenomena are of the same nature as the brain states which underlie them; this materialistic assumption exposed him to much violent criticism, which was directed against Hartley as well. The *odium theologicum* was still very potent, and probably for this reason Priestley's support of Hartley hindered rather than helped the progress of associationism.

Archibald Alison (1757-1839), a clergyman, is the author of a work on esthetics, entitled 'Essays on the Nature and Principles of Taste' (1790), which was much studied during the early part of the nineteenth century. In it he traces out the feelings of beauty, sublimity, and the like, and attributes them to associations of ideational terms with sensations. Matter, he affirms, arouses sensations, not emotions; [1] the latter arise only through the "exercise of the imagination." [2] Alison set himself the task of examining all varieties of experience that arouse the esthetic feelings in literature, painting, sculpture, etc., and endeavored to show that they are based on associated elements. He makes no explicit reference to Hartley in the 'Essays,' and quotes Locke only once,[3] when he borrows a casual anecdote from him. But though he mentions writers of the Scottish school with approval, his own position is thoroughly associationistic, and he was largely instrumental in familiarizing students of art and general readers with that conception of mental processes.

The 'Zoonomia' (1794) of Erasmus Darwin [4] (1731-1802) is an exhaustive treatise in several volumes on physiology and medicine. Though chiefly concerned with biological questions, it includes a psychophysical theory of experience (Pt. I) which is thoroughly associationistic. Darwin puts ideas and motion in parallel, and makes asso-

[1] Essay II, ch. 1, p. 126, 1st ed.
[2] I, ch. 2, p. 49; *cf.* p. 410.
[3] P. 210.
[4] Grandfather of Charles Darwin.

ciations of ideas the counterpart of associations of muscular movements. He attributes to the sensorimotor being four faculties—irritation, sensation, volition, and association,—which give rise to four classes of ideas and movements; the fourth class is less fundamental than the others.

Each of the first three sorts of ideas and movements may be associated.[1] "All animal motions which have occurred at the same time or in immediate succession become so connected that when one of them is produced the other has a tendency to accompany or succeed it."[2] The same is true of ideas, which are never received singly, but always in combination: "those which belong to the same sense seem to be more easily combined into synchronous tribes than those which were not received by the same sense."[3] We have the power of increasing the degree of combination by voluntary repetition of the ideas, or by repetition of the original sensation.[4]

These four writers fill the gap between Hartley and Brown. Tucker was the only one of the four who attempted a thorough analysis, and this marked a return to Locke rather than an advance. Yet they were instrumental in spreading the notion of association in scientific as well as popular circles. Tucker spoke to the preacher and moralist; Alison to the artist and man of letters; Darwin to the naturalist and physician; Priestley to the physical scientist. The attacks of the Scottish school also drew attention to the association concept and led to further study. But the charges of materialism and atheism made many hesitate to adopt the associational standpoint, or even to employ its most evident principles, till Brown, whose philosophy was free from any such odium, cleared it of the stigma.

[1] Sec. 10.
[2] Sec. 4, art. 7.
[3] 15, 1, 1.
[4] *Ibid.*, 2.

### 6. *Thomas Brown's Standpoint*

Thomas Brown (1778-1820), who held the chair of moral philosophy at the University of Edinburgh, was a pupil of Dugald Stewart, through whose teachings he was grounded in the traditions of Reid and the Scottish school. Later he broke away from the psychology of this school, and in his 'Lectures on the Philosophy of the Human Mind' (1820) adopts a standpoint akin to the English movement. His analysis of consciousness is, in fact, a combination of the Scottish and associational viewpoints. With the former writers he regards mind as "a substance possessing certain qualities, susceptible of various affections or modifications, which, existing successively as momentary states of the mind, constitute all the phenomena of thought and feeling." [1] These modifications he attributes to perception, conception, memory, imagination, and rational processes.

But unlike the Scottish psychologists Brown does not consider the mental processes special *faculties* or powers of mind. He makes them, like Hartley, manifestations of the workings of association. Thus, perception is not "a peculiar mental power," but a result of "the power of association, by which one feeling suggests or induces other feelings that have formerly coexisted with it." [2] He prefers to call this power *suggestion* rather than *association,* a point which he argues at great length.

Our consciousness, he claims, is "far from indicating any process of association; and all of which we are conscious at the time of the suggestion itself is the mere succession of one feeling to another—not certainly of any prior process on which this succession has depended." [3] There is no 'union,' as the term association would imply, among the original sensations; and the 'union' of intel-

[1] Lect. 1, Vol. I, p. 13. [2] Lect. 25, I, p. 379.
[3] Lect. 40, II, p. 92.

lectual states consists merely in the fact that they succeed one another in accordance with the original coexistence or succession of sensations.[1]

Brown emphasizes particularly the fact of *succession* among ideas, and his use of the term *suggestion* is partly designed to exclude the notion of coexistence and union among them. The basis of suggestion he believes to be reducible to a single law, *proximity;* he does "not consider any influence distinct from that of the mere existence of the original feelings themselves in their state of proximity to be indicated by our consciousness, or at all necessary to the subsequent suggestions."[2]

Before going further we should note a fundamental difference between Brown's standpoint and that of Hartley, which is really the basis of their disagreement as to the terms *association* and *suggestion* and of other differences which will appear. Hartley, we must remember, based mental association on certain supposed relations among the physical conditions underlying consciousness. Brown's analysis, on the other hand, was concerned solely with the mental phenomena themselves. He aimed to describe the sequence of ideas in purely mental terms, without reference to the physical concomitants of the process. It is not the psychologist's province, he insists, to consider the physiological happenings in the nervous system or elsewhere. Brown differs on this point not only with Hartley but with nearly all later associationists. His attitude is a natural result of his early training. Some writers have refused to consider him an associationist on account of his neglect of the physical side. Yet so rigidly and thoroughly does he carry out his principle of suggestion—which is nothing else but association with all physical reference removed—that he seems unquestionably to belong among the exponents of this doctrine.

At the same time the consequences of this ultra-

[1] *Ibid.*, pp. 87-8.

[2] *Ibid.*, p. 91.

psychological attitude are far-reaching. It alters not only the conception of the associative process, but the distinction between presentative and representative experiences. Other associationists regard ideas as revivals or faint copies of anterior sensory experiences; for Brown, representative phenomena constitute an entirely distinct class and may not properly be regarded as "mere sensations modified or transformed." [1] Not being derivatives, they are no more explicable than sensations: "We may *see* innumerable objects in succession; we may *conceive* innumerable objects in succession. But we see them because we are susceptible of vision; we conceive them because we have that susceptibility of spontaneous suggestion by which conceptions arise after each other in regular trains." [2]

### 7. *Brown's Laws of Suggestion*

As already stated, Brown regards suggestion as a succession based on some previous proximity. "All suggestion, as I conceive, may, if our analysis be sufficiently minute, be found to depend on prior coexistence, or at least on such immediate proximity as is itself, very probably, a modification of coexistence." [3] But this fundamental principle he amplifies into three Primary Laws of Suggestion, namely, *resemblance, contrast,* and *nearness in time and space,*[4] thus harking back to the original classification of Aristotle. His discussion of these laws is wholly by way of illustration and adds little to earlier analysis. The reintroduction of contrast as a separate form of association is a natural consequence of his standpoint: there is no need of reducing it to similarity and contiguity if we have no physiological facts to explain; and there is little use in attempting such a reduction by means of purely mental analysis.

[1] Lect. 33, I, p. 517.
[2] Lect. 41, II, p. 105.
[3] Lect. 35, II, p. 11.
[4] Lects. 35-37.

Probably the most important contribution of Brown to the association doctrine is his formulation of certain Secondary Laws of Association (or Suggestion). In these he seeks to enumerate the circumstances which "modify the influence of the primary laws, in inducing one associate rather than another." [1] They are nine in number:

(1) The relative *duration* of the original sensations: "The longer we dwell on objects, the more fully do we rely on our future remembrance of them." [2]

(2) Their relative *liveliness:* "The parts of a train appear to be more closely and firmly associated as the original feelings have been more lively." [3]

(3) Relative *frequency:* "The parts of any train are more readily suggested in proportion as they have been more frequently renewed." [4]

(4) Relative *recency:* "Events which happened a few hours before are remembered when there is a total forgetfulness of what happened a few days before." [5]

(5) Their coexistence in the past with *fewer alternative associates:* "The song which we have never heard but from one person can scarcely be heard again by us without recalling that person to our memory." [6]

(6) *Constitutional differences* between individuals modify the primary laws: They give "greater proportional vigor to one set of tendencies of suggestion than to another." [7]

(7) Variations in the *same individual,* "according to the varying emotion of the hour." [8]

(8) "Temporary *diversities of state,*" as in intoxication, delirium, or ill-health.[9]

(9) Prior *habits of life* and thought—the influence of inground tendencies upon any given situation, however new or irrelevant the experience may be.[10]

[1] Lect. 37, II, p. 44. [2] *Ibid.* [3] *Ibid.* [4] P. 45.
[5] *Ibid.* [6] *Ibid.* [7] P. 46. [8] P. 50.
[9] P. 51. [10] P. 52.

According to Brown the primary laws "are founded on the mere relations of the objects or feelings to each other," [1] while the secondary laws indicate the influence exerted by circumstances or conditions upon the particular application of the primary laws.

The first four of the secondary laws are summed up in a single statement: "When the two associate feelings have both (together or in immediate succession) been of long continuance, very lively, very frequently renewed in the same order, and that recently, the tendency to suggest each other is most powerful." [2] The fifth law might well have been included in this statement, and the remaining laws might readily have been summed up in another generalization.

### 8. *Brown's Analysis of Mental Phenomena*

Brown's departure from the Scottish faculty psychology is shown in his structural interpretation of mind. Rejecting the division into intellectual and active powers —into *understanding* and *will*—he regards all mental phenomena as states (or affections) of mind, and divides these states first of all into *external* and *internal*.[3] The former are "the result of the laws both of matter and of mind—implying in external objects a power of affecting the mind, as well as in the mind a power of being affected by them"; the latter "result from the susceptibilities of the mind itself. . . . The affections of the one class arise because some external object is present; the affections of the other class arise because some previous change in the states of the mind has taken place." [4] The external affections are "so very simple as to require but little subdivision." The internal affections form two great classes: "our *intellectual states of mind*, and our

[1] P. 53.
[2] *Ibid.*, p. 53.
[3] Lect. 16, I, p. 249.
[4] *Ibid.*

*emotions*." [1] Brown regards the emotions as for the most part 'active,' but he is unwilling to class them specifically as active powers or states,—partly because our intellectual states are essential elements in the activity of the emotions, partly because some of the emotions "cannot with propriety in any case be termed active—such as grief, joy, astonishment . . . the feelings of beauty and sublimity," etc.[2]

Brown's examination of the various states is lengthy, and for the period in which he wrote it is very complete. But at times he is lacking in scientific sequence, and owing to his constant reiteration and his wealth of illustration it is difficult to grasp his analysis in its entirety. The main point of interest in his review of sensations, or external states of mind, is the distinction which he makes between the sensations proper of each sense, and the associated feelings of resistance and extension, which constitute our knowledge of the qualities of matter.[3] Resistance in itself, and extension as known through resistance, are due not to touch, but to the muscles.[4] Perception is "only another name . . . for the result of [these] associations and inferences." [5] We shall see the importance of this analysis as developed by later writers.

His treatment of the internal states is closely bound up with the discussion of suggestion, to which he attributes them. As a result of his anti-physiological attitude he is led to treat of conception before he takes up memory, regarding the former as a simpler type of experience. Our memories, in fact, are "nothing more than conceptions united with the notion of a certain relation of time." [6] Certain circumstances, such as entering a friend's house, suggest that friend.[7] This idea he regards as a conception; it only "becomes a remembrance when we combine with it this feeling of relation—the rela-

[1] *Ibid.*, p. 251. [2] *Ibid.* [3] Lects. 22-25. [4] Lect. 23, I, pp. 345-7.
[5] Lect. 25, I, p. 382. [6] Lect. 41, II, p. 107. [7] P. 104.

tion which constitutes our notion of time." [1] Conception itself is simple suggestion.[2] Neither conception nor memory are voluntary acts of mind: ideas "arise uncalled; . . . what is termed voluntary recollection . . . is nothing more than the coexistence of some vague and indistinct desire with our simple trains of suggestion." [3] So too, imagination is not "a voluntary selection and combination of images," [4] but the result of simple suggestion: various complex conceptions "may exist together, forming one complex feeling, and . . . one part of this complexity may suggest one conception while another part suggests a different conception, that may in like manner unite and form one harmonizing whole," [5] which is an imagination.

This is followed by a discussion of habit, which (without any apparent reason) Brown makes coordinate with conception, memory, and imagination. Habit may be considered in two lights, as it "produces a greater *tendency* to certain actions, and as it occasions greater *facility* and excellence in those particular actions." [6] The former aspect, the heightened tendency, he attributes to suggestion: "If feelings tend to produce other feelings in consequence of former proximity or coexistence, it would indeed be most wonderful if habitual tendencies were not produced." [7] His thought seems to be that when the same idea-and-act has occurred frequently in similar connections, it is on that account more likely to lead to the same succeeding idea-and-act. On the mere doctrine of chances one may well believe this; but his rejection of the physiological side debars him from using the additional argument which other associationists appeal to, namely, that the *repetition* itself produces a greater tendency to reinstate the sequence on account of the modifications in the brain state which it induces, whereby the

[1] P. 108. [2] P. 104. [3] P. 114. [4] Lect. 42, II, p. 125.
[5] P. 127. [6] Lect. 43, II, p. 141. [7] P. 144.

connection is rendered more close. Brown has already mentioned *frequency* as one of the secondary laws of suggestion, and the statement that habit produces a greater tendency is only a reiteration of this generalization.

More satisfactory is his attempt to describe the greater *facility* of performance produced by habit. In striving to perform a certain act for the first time, we make all sorts of mistakes, "in our ignorance of the particular muscles and particular quantities of contraction. . . . By frequent repetition, however, we gradually learn and remedy our mistakes. . . . At almost every repetition either some muscle is left at rest which was uselessly exerted before, or the degree of contraction of the same muscles is brought nearer and nearer to the desired point." [1] Brown does not attempt to show how the useless contractions fall out, but he might have done so without departing from his introspective standpoint.[2] His view that we may "reduce the habit itself to the mere power of association," [3] however, is rather a reversal of the ordinary associational position.

### 9. *Brown's Theory of Relative Suggestion*

Brown distinguishes two sorts of suggestion: *simple* and *relative*. Simple suggestion, as already noted, is the tendency of the mind, on the appearance of a certain experience, to call up some other idea by reason of their previous proximity. Perception and the representative processes just mentioned belong to the province of simple suggestion. Neither in perception as such, nor in con-

[1] Pp. 144-5.

[2] He would say that the proper contractions lead to the performance of the act, and hence to sensations corresponding to the previous idea, which is thus reinstated; while the inappropriate contractions do not reinforce the idea, and are therefore more likely to fall out.

[3] Lect. 37, II, p. 52.

ception, memory, etc., do we attain the idea of a relation existing between different objects of experience. This idea of relation is due to relative suggestion.

Relative suggestion is "the tendency of the mind . . . by which, on perceiving or conceiving objects together, we are instantly impressed with certain feelings of their mutual relation." [1] These "feelings of relation are states of mind essentially different from our simple perceptions or conceptions of the objects that seem to us related, or from the combinations which we form of these in the complex groupings of our fancy." [2] They are due to "an original tendency or susceptibility of the mind, by which, on perceiving together different objects, we are instantly, without the intervention of any other mental process, sensible of their relation in certain respects." [3]

Brown divides the relations so experienced into two general classes: relations of (1) *coexisting*, and (2) *successive* objects or feelings. Under coexistence he specifies position, resemblance, degree, proportion, and comprehensiveness or part and whole; [4] under succession he mentions sequence (casual priority and posteriority), and causality (antecedent and consequent).[5] The rational processes of judgment, reasoning, and abstraction he reduces to cases of relative suggestion." [6]

In his treatment of relative suggestion Brown departs from the association standpoint. The idea of relation is, according to him, an entirely new experience; he does not attempt to derive it or in any way correlate it with past experiences, as he does in the case of simple suggestion.

Brown makes an important contribution to mental analysis in pointing out the distinction between our *experience of related things* and our *awareness of the relation*. This distinction brought to light a new problem, which later associationism was called upon to solve.

[1] Lect. 51, II, p. 275. [2] Lect. 45, II, p. 169. [3] *Ibid.*
[4] Lect. 46, II, p. 183. [5] Lect. 51, II, p. 267. [6] *Ibid.*

Brown's own solution is not associational: he goes over to intuitionism when he attributes our awareness of relations to an original tendency of the mind. Here again it is his ultra-psychological attitude that determines his answer. Had he been concerned with physiological correlates, he would have assumed some plausible process of nerve activity, taking place concomitantly with the rise of these new ideas of relation; or he might claim that the ideas of relation are not really new types of experience, but merely modifications of the experience of related sensations. Instead, he makes them something quite different from any other element of experience.[1]

According to Brown the complex mental states which are formed through simple and relative suggestion are not merely 'compositions,' but fusions as well. As we have seen, earlier writers, such as Tucker and Priestley, also conceived of complex experiences as being modified so that they become somewhat different from their constituent elements. Brown states this view very explicitly: "In this spontaneous chemistry of mind, the compound sentiment that results from the association of former feelings has in many cases, on first consideration, so little resemblance to these constituents of it, as formerly [existed] in their elementary state, that it requires the most attentive reflection to separate . . . the assemblages which even a few years have produced."[2] This notion of *mental chemistry* was taken up and elaborated by John Stuart Mill and other writers.

Brown's analysis is for the most part very acute, but its value is considerably impaired by his rambling style of presentation. His illustrations and many of his arguments are over-rhetorical. The lectures show plainly

[1] The present writer considers the rise of 'awareness of difference' in experience the most difficult problem that confronts the association psychology. We shall see how later associationists have attempted to explain it.

[2] Lect. 10, I, p. 156.

that they were addressed to pupils rather than mature thinkers. There is also a constant tendency to emphasize the direct agency of Deity, which does not, however, impair the thoroughness of his insight into the connections of mental phenomena. His influence on later writers appears to lie especially in four directions: (1) in calling attention to the 'secondary' or quantitative laws of association; (2) in giving prominence to the muscle sense and experiences derived therefrom; (3) in calling attention to the experience of 'relation'; and (4) in emphasizing the chemical mode of composition as an analogy applicable to the phenomena of mental fusion.

## CHAPTER II

## JAMES MILL AND THE LATER ASSOCIATIONISTS

### *1. James Mill*

The division of the association movement into periods should not be regarded as sharp and absolute. In passing from Hobbes and Locke to Hartley, or from Hartley and Brown to the Mills, we find no great break. A gradual development and broadening of the fundamental conceptions and a progressive extension of the analysis has already been noted. The same is true in the transition to the later period. Yet there appear to be sufficient grounds for grouping the 'pure associationists' into two chronological periods.

The writings of the elder Mill mark the beginning of a new stage of development. The period examined in the preceding chapter is marked by a *groping* after fundamental terms, and by a somewhat desultory or at least unsystematic analysis. The writers of the later period *assume* the fundamental notions of association, and their task is to make the analysis more orderly and far-reaching. It must be remembered that the chief concepts of the association theory were now well known to English readers; that associationism constituted one of the dominant types of philosophy; and that systems of ethics, esthetics, jurisprudence, economics, and even history and theology had been formulated upon an associational basis, either avowedly or tacitly.[1] The time was

[1] By the writers mentioned in Chapter I—Tucker, Alison, Adam Smith, Bentham—and their followers. Among the numerous later

ripe for a new analysis—not merely *based* on the principle of association, but conducted in that *sequential* way which association itself invites.

James Mill (1773-1836), in early life a clergyman of the Scottish Church and later employed in the home office of the East India Company, undertook this work, and infused new life into the association movement. His 'Analysis of the Phenomena of the Human Mind' (1829) is the classic of nineteenth century associationism, as Hartley's 'Observations' is the classic of the eighteenth century. Taken in connection with the editorial notes of Bain and the younger Mill, and interpreted in the light of Bain's two volumes on psychology, it constitutes the most representative treatment of the association psychology.

James Mill accepts Hartley's conception of mental phenomena rather than Brown's. He gives due emphasis to the activity of the brain and nervous system, and makes free use of the physiological concomitants to explain and illustrate the principles of mental activity. But the influence of Brown's work is shown in many parts of his analysis, as well as by several specific references.[1]

Mill adopts a fundamental classification of mental data into *sensations* and *ideas,* which he considers "two classes of feelings,"[2] and begins with an investigation of sensation. Besides the traditional five senses he notices three other sorts of sensation—sensations of disorganization

writers may be mentioned Sir James Mackintosh (1765-1832) in ethics; John Austin (1790-1859) in jurisprudence; George Grote (1794-1871), who contributed to the annotated edition of James Mill's 'Analysis'; James Martineau (1805-1900) in ethics; E. A. Freeman (1832-1892) in history; Sir Henry J. S. Maine (1822-1883) in jurisprudence; William B. Carpenter (1812-1885) and Henry Maudsley (1835-1918) in physiology.

[1] E.g., ch. 1, § 7; see also references to Brown in preface to J. S. Mill's edition of the 'Analysis.' Page citations below are to this edition (London, 1878, 2d ed.).

[2] Ch. 2, p. 52.

(physical pain), muscular sensations (which he carefully distinguishes from tactile), and sensations in the alimentary canal (corresponding roughly to what are now termed organic or systemic sensations).

The experiences derived from these senses are by no means simple. "We can not think of the sensation of color, without at the same time thinking of something colored—of surface or extension, a notion derived from another sense. . . . Some of the things suggested by the sensations of sight, as extension and figure, are suggested so instantaneously that they appear to be objects of sight, things actually seen." [1] Our notion of any sense is really a very complex idea, including as ingredients (1) the idea of the organ, (2) the idea of the sensation, (3) the idea of the object of sensation, (4) the idea of synchronous order of the first two, and (5) the idea of a successive order of the third.[2] Mill's discussion of sensation is very brief, touching only upon the general points needed further along in his analysis.

The distinction between sensation and idea is introduced by the notion of primary memory or the after-image: [3] "After I have seen the sun, and by shutting my eyes see him no longer, I can still think of him. I still have a feeling, the consequence of the sensation, which, though I can distinguish it from the sensation, . . . is yet more like the sensation than anything else can be; so like, that I call it a copy, an image, of the sensation; sometimes a representation or trace of the sensation." [4] This copy or trace is conveniently called an *idea;* and for the process he coins the term *ideation,* analogous to *sensation.*[5] Sensations and ideas are the "primary states of consciousness"; [6] but the sensation is more fundamental

[1] Ch. 1, § 3, pp. 21-2. [2] Ch. 1, § p. 19.
[3] He probably refers to both, and has in mind the passage from one to the other.
[4] Ch. 2, p. 52. [5] P. 53. [6] P. 62.

than the idea, inasmuch as the second occurs "only when the first has previously existed." [1]

Mill does not accept the traditional view that ideas are always fainter than sensations, though he believes this to be usually the case.[2] Some ideas are fainter than others—a condition which is due quite as much to the relative remoteness of the original sensation as to the relative vividness of that sensation; [3] but it is difficult, he says, to compare the relative vividness of sensations, except when they are pleasurable or painful.[4] This conclusion is probably due to his confusing distinctness with intensity; he finds that some ideas have as great distinctness or prominence in consciousness as some sensations, and from this he concludes that they are in no degree fainter.

### 2. *James Mill's Conception of Association*

James Mill now passes to the problem of association. The order of occurrence of ideas depends on the order of sensations, which is conditioned only by "the order established among what we call the objects of nature." [5] Sensations occur in *synchronous order* and in *successive order;* and "it so happens that . . . most of those which are observed synchronously are *frequently* observed synchronously, most of those which are observed successively are *frequently* observed successively." [6] "Our ideas spring up, or exist, in the order in which the sensations existed of which they are the copies." [7] "This is the general law of the *association of ideas,* by which term . . . nothing is here meant to be expressed but the order of occurrence." [8] Where sensations have occurred for the most part together, such as the smell, appearance, and contact of a rose,[9] their

[1] P. 55. [2] Ch. 3, p. 84. [3] P. 85. [4] P. 84. [5] Ch. 3, p. 71.
[6] P. 77. [7] P. 78. [8] *Ibid.* [9] P. 79.

ideas also spring up together; where they have occurred for the most part in succession, as in the repetition of the numbers *one, two, three,* etc.,[1] their ideas also arise in succession.

Mill's detailed exposition of the conditions of association is in striking contrast with the brevity of his preceding analysis. "A far greater number of sensations," he says, "are received in the successive than in the synchronical order;" and of our ideas, an infinitely greater number rise in the successive order.[2] When we speak of the *succession* of ideas, we are not to suppose that any power resides in the earlier over the later; they are "only antecedent and consequent, with the additional idea that such order is not casual, but to a certain degree permanent."[3] Of two successive feelings, the suggesting and the suggested, the antecedent may be either sensation or idea, the consequent is always an idea.[4] Often in an association, "the antecedent is of no importance farther than as it introduces the consequent. In these cases the consequent absorbs all the attention and the antecedent is instantly forgotten."[5] Thus, when we are listening to a conversation the sounds which we hear are obliterated in the thoughts to which they give rise.[6]

There are degrees in association just as there are degrees in sensations and degrees in ideas. Mill finds three conditions which modify the degree: An association is said to be stronger than another when it is (1) "more permanent," (2) "performed with more certainty," and (3) "performed with more facility."[7] "The causes of strength in association seem all to be resolvable into two: the vividness of the associated feelings, and the frequency of the association."[8] These two principles of *vividness* and *frequency* are Mill's substitute for Brown's secondary laws.

[1] P. 80. [2] P. 81. [3] *Ibid.* [4] *Ibid.*
[5] Pp. 98-100. [6] P. 101. [7] P. 82. [8] P. 83.

After frequent repetition of an association, the ideas "sometimes spring up in such close combination as not to be distinguishable"; [1] they "seem to run into one another, to coalesce, as it were, and out of many to form one idea; which idea, however in reality complex, appears to be no less simple than any one of those of which it is compounded." [2] Thus, the idea of extension is derived from the muscular feelings that arise in connection with the movement of different parts of the body; [3] and our ideas of external objects (for example, a tree) are formed from "the ideas of a certain number of sensations received together so frequently that they coalesce, as it were, and are spoken of under the idea of unity." [4] The simple ideas thus combined "are so intimately blended as to have the appearance, not of a complex, but of a simple idea." [5] Further, "some ideas are by frequency and strength of association so closely combined that they cannot be separated. If one exists, the other exists along with it, in spite of whatever effort we make to disjoin them." [6] For example, "it is not in our power to think of color without thinking of extension, or of solidity without figure." [7] Such associations he calls *inseparable* or *indissoluble*.

Mill examines Hume's three laws of association—contiguity in time and place, causation, and resemblance—in the light of his own theory. Contiguity, he says, "must mean that of the sensations" which underlie the ideas; [8] contiguity in time "means the successive order," while contiguity in place "means the synchronous order." [9] But Mill has already shown that the ideas merely follow the order of the sensations, whether successive or synchronous; the law of contiguity thus reduces to Mill's more fundamental law of frequency. Causation is "the same with contiguity in time, or the order of

[1] P. 90. [2] P. 91. [3] P. 92. [4] P. 93. [5] P. 92.
[6] P. 93. [7] *Ibid.* [8] P. 108. [9] Pp. 109-10.

succession." [1] Resemblance is noticed by us only because "we are accustomed to see like things together"; [2] that is, we often experience at the same time a number of similar sensations—"when we see a tree, we generally see more trees than one," etc.[3]—and resemblance is thus reduced to Mill's law of frequency. We shall notice presently J. S. Mill's wide disagreement with his father on this particular point. Association by contrast, according to James Mill, is due either to the fact that the contrasted objects are both deviations from a common standard (for example, a dwarf and a giant), or to the fact that they are experienced in succession (pain, followed by pleasurable relief from pain).[4]

Mill concludes by calling attention to the association of complex ideas together into a 'doubly compounded,' or 'duplex' idea.[5] These duplex ideas (*decomplex* ideas in Hartley's terminology) may be of all degrees of complexity. "My complex idea of glass and wood and others compose my duplex idea of a window;" several such duplex ideas "united together compose my idea of a house"; and so on, in increasing complexity, till at length we reach the culmination of the series in "the idea called Every Thing." [6]

James Mill's account of the growth of mental complexity brings out a characteristic which runs through his whole analysis and differentiates him quite sharply from other associationists—namely, the *mechanical* view which he takes of the associative process. The association theory is in the nature of things *mechanistic,* inasmuch as it opposes on the one hand the casual or indeterministic hypothesis of experience and on the other hand the hypothesis of innate ideas or forms. It conceives of mind, or experience, as a series of mental states united into various complexes and successions, very much

[1] P. 110. [2] P. 111. [3] *Ibid.*
[4] P. 114. [5] P. 115. [6] Pp. 115-116.

as the atoms of the physical universe are united into material things and produce material events. Associationism, then, may properly be termed mechanistic, because it employs the material pattern for the explanation of mental phenomena. But material events follow chemical principles as well as physical; and most associationists have applied both concepts to mental synthesis.

James Mill, however, ignores the chemical analogy entirely, and practically makes the physical-mechanical type his sole pattern for the laws of mental coexistence and succession. He does, it is true, notice the *seeming* coalescence of ideas into a complex experience which is apparently simple.[1] And if the experience *appears to be* simple, he might consistently have affirmed, with J. S. Mill, that *as an experience* it *is* simple. But he does not admit this, and so loses the benefit of 'mental chemistry.' In the passage just mentioned he cites, as analogous to the coalescence of ideas, the coalescence of *sensations* when a color wheel of several sectors with various spectral colors is rotated rapidly, giving the sensation of *white*. From the present-day standpoint the sensation in this case is simple. To Mill it is only apparently so.[2]

[1] Ch. 3, p. 91.

[2] It is interesting to note how often the expressions 'as it were,' 'apparently,' 'seeming,' occur in this discussion. I believe James Mill's attitude is responsible for the widespread notion that 'pure' associationism (that is, the movement up to and including him) is essentially physical-mechanical, a mistake which even leading historians of the English psychology have shared. In preceding chapters attention has been called to passages in the works of earlier representatives of the school which show that they take a broader view and recognize a fusion of experiences after the chemical pattern. Since associationists generally, with the exception of James Mill and possibly Bain, hold this view, it seems proper to consider 'mental chemistry' an integral part of the association doctrine. (*Cf.* art. 'Associationism' in Baldwin's *Dictionary of Phil. and Psychol.*, for the opposite view.) Bain studiously avoids the question; while he apparently agrees with James Mill, there is nothing in his analysis incompatible with mental chemistry. The term *mechanistic* is used above in the sense in which contemporary biologists apply it—to denote the type of process found in both chemical and physical activity.

This narrowed viewpoint manifests itself throughout his analysis of the higher intellectual experiences, or *higher complexes,* as he terms them, which immediately follows the discussion of association.

### *3. J. Mill's Analysis of Cognitive Phenomena*

The phenomena of consciousness are classed by James Mill as sensations, simple ideas which are their copies, complex ideas, and trains of ideas. In all complex ideas *symbolism,* or the process of *naming* as Mill calls it, is involved.[1] Names are signs or marks attached to single sensations, clusters, and ideas; they are also marks which serve to introduce ideas or trains of ideas.[2] "The name *rose* is the mark of a sensation of color, a sensation of shape, a sensation of touch, a sensation of smell, all in conjunction." [3] This is as near as James Mill comes to admitting an association of sensations. It is his equivalent for *perception.* He attributes this naming by clusters to motives of economy.

The naming of ideas follows the naming of the sensations of which they are copies; but there are also complex ideas "derived indeed from the senses but put together in arbitrary combinations." [4] These arbitrary clusters, which he terms 'mental' as distinguished from 'sensible' ideas, also receive names. Adjectives arise from subordinate distinctions among ideas, as for example when we characterize sounds as loud or low, harsh or sweet, etc.[5] Verbs are particular kinds of adjectives, characteristic of motion and action.[6] Mill analyzes in a similar way the minor parts of speech, and discusses predication, which he considers a device to mark the order of sensations and ideas.[7] Besides the assignment

[1] Ch. 4, p. 128. [2] Pp. 128, 130, 134, 135. [3] Ch. 4, § 1, pp. 134-5.
[4] P. 138. [5] P. 145. [6] P. 151.
[7] P. 161.

of names, as marks, to "clusters of ideas called objects," there are two other notable processes in naming: (1) *Classification,* or "generalizing those names so as to make them represent a class"; and (2) *Abstraction,* or "framing adjectives by which minor classes are cut out of larger." [1] These two important functions Mill regards as by-products of the naming process.

Conception is the process among ideas analogous to perception among sensations; it applies to clusters, not simple ideas. Thus we do not say, "I conceive red," or green; but we do say, "I conceive a horse," a tree, a ship; [2] in such cases a number of simple ideas are 'taken together' (con-ceived) in one experience.[3] Conception, then, is not a new mental process; it merely serves to denote a complex idea to which a name has been given. In like manner, imagination is not a distinct 'power'; it is merely the term applied to "the manner in which ideas succeed one another in a train." [4]

James Mill considers conceptions and imaginations as simpler types of experience than memory, which is "an idea and something more." [5] In this he is in agreement with Brown; though the general trend of his analysis follows Hartley's more nearly. In remembering, he says, "the mind runs back from the present moment to the moment of perception; that is to say, it runs over the intervening states of consciousness called up by association; . . . and in this case we associate them so rapidly and closely that they run, as it were, into a single point of consciousness, to which the name *memory* is assigned." [6] This is true whether the starting-point be a *sensation,* which we remember to have experienced before, or an *idea* which is remembered as a former sensation or idea.[7]

This explanation of memory illustrates again the un-

[1] Ch. 9, pp. 295, 294. [2] Ch. 6, p. 233. [3] P. 234.
[4] Ch. 7, p. 238. [5] Ch. 10, p. 321. [6] P. 331.
[7] Pp. 329-35. Compare Aristotle in the passage quoted in Chapter II.

wieldiness of Mill's mechanical view of association. It is patent that we do not in the majority of cases actually 'run over' the intervening experiences—as the younger Mill takes pains to point out in a note on this passage. James Mill of course regards the process as syncopated to the utmost; but even so his description appears strained to his most sympathetic disciples; his difficulties are due (from the associationist's standpoint) to his unwillingness to admit the presence of transforming synthetic factors in the associative process.

As already noted, James Mill considers predication a mere variety of the naming process. Passing to the allied notion of *belief*, he subjects it to a minute analysis. The reason for this disproportionately close examination seems to have been the earnest controversy which had been going on since Hume's time regarding belief in causality and belief in the external world, especially by Thomas Reid,[1] Dugald Stewart,[2] and Thomas Brown.[3] Mill saw that belief is a crux for the association doctrine. Hume and Brown had treated its psychological aspect very cursorily, and Hartley's discussion of *assent* (his equivalent for belief) was by no means thorough. Mill divides belief into three prime sorts: (1) Belief in events or real existences; (2) Belief in testimony; and (3) Belief in the truth of propositions.[4] The first case, which he holds to be the most important of all, comprises (a) belief in present events (including i, existences present to the senses, and ii, those not present to the senses), (b) belief in past events, and (c) belief in future events.

Belief in existences present to the senses (perception) includes something more than mere belief in present sensations—which is another name for having (or experienc-

[1] 'Enquiry into the Human Mind,' 1764, ch. 2, and 'Essays on the Intellectual Powers of Man,' 1785, II, ch. 20.
[2] 'Elements of the Philosophy of the Human Mind,' 1792, I, ch. 3.
[3] 'On the Relation of Cause and Effect,' 1818, pass.
[4] Ch. 11, p. 344.

ing) the sensations. It involves, besides the present sensations, associated memories of tactile and muscular sensations, giving ideas of extension, distance, and resistance, and other sense memories "inseparably united one with another, and inseparably united with the idea of ourselves as having them."[1] Our belief in the physical objects *causing* the sensations is a belief in causation. Mill resolves causation into an invariable connection of antecedent and consequent, and he resolves belief in causation into an inseparability which leads us to regard the complex experience as a unit.[2] Belief in the existence of objects not present to the senses reduces to a case of testimony if we have never perceived these objects; if we have experienced them in the past and believe in their present existence, something more than memory is involved, namely, the belief that we shall experience them again if we are "in the same situation"[3]—which reduces to belief in the future.

Belief in past existences Mill resolves into memory or belief in testimony, as the case may be. Belief in the future, he finds, is due to indissoluble associations among our past experiences, which mark off the constant from the casual sequences,[4] and which we term "the uniformity of the laws of nature."[5]

Belief in testimony means belief in events as a result of testimony from others instead of our own experience; but the testimony itself is a present (or past) event, and belief in this has already been resolved into indissoluble association.[6]

Belief in the truth of general propositions involves predication, or judgment, and this is shown to be merely an indissoluble association of names or marks belonging to two clusters of ideas.[7] "To have two ideas, one a part

[1] P. 349. [2] P. 352. [3] P. 355.
[4] Pp. 363-8. [5] P. 384. [6] Pp. 381, 385.
[7] Pp. 388-90.

of another, and know that one is part of another, is not two things, but one and the same thing." [1]

Belief, then, in any of its aspects, is a mere case of indissoluble association.[2] Mill criticizes Locke's distinction between right and wrong belief: "Wrong belief is belief no less than right belief." Both proceed from association. The most we can say is that "when ideas are connected not in conformity with the connection of things, the belief is wrong belief." Custom, however, unites ideas more often in conformity with the connections among things than otherwise.[3]

### *4. J. Mill: Motor and Affective Phenomena*

The remainder of the 'Analysis' may be summed up briefly. Ratiocination is association of the terms of propositions into a train.[4] Reflection on any specific idea is merely "the having an idea, and knowing it," which are "one and the same thing." [5] The "idea of reflection is simply the generalization of particular" experiences.[6]

James Mill attributes the distinction between intellectual and active powers of the mind to the fact that while some "sensations and ideas are considered merely as existing," others are "considered as not merely existing, but also as exciting to action." [7] The will he regards as "that peculiar state of mind or consciousness . . . by which action is preceded." [8] It consists in "an idea of the thing willed," [9] that is, of the action, associated with desire; and "the idea of the outward appearance of the action, . . . excited by association, excites in the same way the idea of the internal feelings which are the immediate antecedent of the action, and then the action takes place." [10] "Whatever power we may possess over

[1] P. 392.
[2] Pp. 369-77.
[3] Pp. 380-1.
[4] Ch. 12.
[5] Ch. 15, Vol. II, p. 178.
[6] *Ibid.*, p. 179.
[7] Ch. 16, II, p. 181.
[8] Ch. 24, II, p. 328.
[9] P. 358.
[10] Pp. 378-9.

the actions of our muscles, must be derived from our power over our associations," and this power "means nothing more than the power of certain interesting ideas, originating in interesting sensations, and formed into strength by association." [1]

The affective consciousness Mill regards as a character of sensation. Sensations are indifferent, painful, or pleasurable; and this distinction runs through all the senses; the pleasures and pains of the "internal parts of the body," though they have no special names, "hold a great share in composing the springs of human action." [2] When anticipated as future, they become in certain cases motives.[3] "The idea of a pain or pleasure is not a pain or pleasure;" but this merely means "that the idea of a pleasurable or painful sensation is not a sensation." [4]

Thus James Mill succeeds in ridding his psychology of any distinct 'affective' element, as he has rid it of a distinct 'active' element. Every experience is resolved into sensations and ideas, combined into groups, or following in trains, by the single process of association; and the principle of association itself is reduced to its simplest terms—the tendency of ideas to group themselves or succeed one another after the manner of their originals. His analysis is the most thorough of any up to his time, and the most systematic in its passage from point to point. It is also the most rigidly associational—and, as has been indicated, it holds to a very narrow type of associationism. Unsatisfactory in many points even to those predisposed in favor of the theory, it nevertheless furnished them with a complete survey of the field; and thus it naturally became the starting-point for later work. The writers who followed Mill adopted much of his analysis, and that which appeared faulty or strained served only to stimulate more careful examination.

[1] P. 379.
[2] Ch. 17, II, p. 185.
[3] Ch. 22.
[4] Ch. 19, II, p. 190.

### 5. *John Stuart Mill's Law of Association*

John Stuart Mill (1806-1873), the son of James Mill, was connected with the East India Company till the age of fifty; he was at the same time engaged in editorial work and other writing, and in the later years of his life devoted himself chiefly to study and literature. His psychology is closely linked to that of his father, his own original work being chiefly in the field of logic. He was a more critical thinker than the elder Mill, and saw difficulties where the latter was content with a plausible explanation.

J. S. Mill was impressed with the force of some of the objections to associationism raised by William Hamilton[1] and others, and realized the weakness of certain parts of the 'Analysis'; he accordingly amended the theory in several respects. We are fortunate in having his views presented in critical annotations to James Mill's masterpiece, which he edited in connection with Alexander Bain (1869). The reasons for his emendations are thus made clear. He does not hesitate to bring out incisively the points in which he differs with his father. The chief of these, already alluded to, is his broader conception of the associative process, which he pictures as a 'chemical' union instead of a merely 'physical' conjunction; there are also many points of difference in the analysis itself, especially in connection with the intellectual processes. Besides the notes to his edition of the 'Analysis,' his psychological views are found in his 'Logic' (1843), and in his 'Examination of Sir William Hamilton's Philosophy' (1865).

A chapter in the 'Logic,' on the Laws of Mind,[2]

[1] The historical note on Association and the discussion of its principles by Hamilton have been referred to in Chapter I. Though himself a follower of the Scottish school, Hamilton's work was of great value to the later associationists and stimulated them to review the underlying principles of their doctrine.

[2] Bk. VI, ch. 4.

presents his conception of association very clearly, though his views were modified somewhat in later years.[1] The subject-matter of psychology, he declares in this chapter, is the determination of the laws according to which one mental state succeeds another.[2] Two of the most general laws are as follows: (1) "Whenever any state of consciousness has once been excited in us, no matter by what cause, an inferior degree of the same state of consciousness, a state of consciousness resembling the former but inferior in intensity, is capable of being reproduced in us without the presence of any such cause as excited it at first."[3] This defines the nature of ideas in relation to sensations. (2) "These ideas, or secondary mental states, are excited by our *impressions* or by *other ideas* according to certain laws which are called Laws of Association."[4]

There are three such laws: "The first is that similar ideas tend to excite one another. The second is that when two impressions have been frequently experienced (or even thought of) either simultaneously or in immediate succession, then whenever one of these impressions or the idea of it recurs, it tends to excite the idea of the other. The third law is that greater intensity in either or both of the impressions is equivalent, in rendering them excitable by one another, to a greater frequency of conjunction."[5]

It will be noticed that the first is the familiar law of *Similarity;* the second is *Contiguity,* which Mill combines with Frequency or Habit; the third is the law of *Intensity.* Mill rejects the law of Contrast absolutely; in a note to the 'Analysis' he declares that "black does not remind us of white more than of red or green; if light

[1] Quotations are from the 8th edition—the last revised by the author.

[2] *Loc. cit.,* § 3.

[3] *Ibid.*

[4] *Ibid.*

[5] *Ibid.*

reminds us of darkness, it is because darkness is the mere negation, or absence, of light." [1]

In a later work J. S. Mill postulates four laws instead of three: (1) Similarity and (2) Contiguity, stated practically as before, but without the reference to Frequency. (3) The law of Frequency, stated in a somewhat modified form: "Associations produced by contiguity become more certain and rapid by repetition. When two phenomena have been very often experienced in conjunction, and have not in any single instance occurred separately either in experience or in thought, there is produced between them what has been called Inseparable, or less correctly Indissoluble Association." [2] (4) When an association has acquired this character of inseparability . . . not only does the *idea* called up by association become in our consciousness inseparable from the idea which suggested it, but the *facts* or phenomena answering to these ideas come at last to seem inseparable in existence." [3]

Mill differs with his father on the question of Similarity, making it the first principle of association. Similarity is not reducible to mere frequency of experience, for we experience unlike things together more frequently than many like things, yet they do not suggest one another in the same degree as do like things.[4] He goes rather to the other extreme, assigning frequency a role in connection with contiguity but not with similarity. It is interesting here to note Mill's use of one of his canons of induction to account for inseparability of association. In the 'Examination' he omits the law of intensity, which he seems to think deducible from frequency under the law of Inseparable Association. Special emphasis is laid on this notion of inseparable association, to which he attaches an important epistemological role

[1] Vol. I, p. 126.
[2] 'Exam.,' ch. 11, Vol. I, p. 235; *cf.* ch. 6, p. 83, ed. of 1865, Boston.
[3] *Ibid.*
[4] 'Anal.,' I, p. 111 ff.

in the fourth law. In criticism of the term *indissoluble* he urges that associations which have become for the present inseparable may nevertheless be dissolved in time.[1]

Mill holds that the laws of association are supplemented by certain laws of *oblivescence*, the principal one of which he states as follows: "When a number of ideas suggest one another by association with such certainty and rapidity as to coalesce together in a group, all those members of the group which remain long without being especially attended to, have a tendency to drop out of consciousness."[2] They may even "disappear from consciousness as completely as if they had never formed part of the series."[3] By this law of lapsed links, taken perhaps from Tucker, he is able to account for the limitations of memory without resorting to the elder Mill's questionable hypothesis that all intervening states actually pass rapidly through consciousness each time we have a recollection.

J. S. Mill's view of the compounding of experiences is most clearly stated in his 'Logic.' Certain of our complex ideas, he says, are *generated* from simple ones; they do not *consist* of them. For, "the effect of concurring causes is not always precisely the sum of the effects of those causes when separate, nor even always an effect of the same kind."[4] In psychology, as in the physical sciences, there are two distinct types: "The laws of the phenomena of mind are sometimes analogous to mechanical, but sometimes also to chemical laws. When many impressions or ideas are operating in the mind together, there sometimes takes place a process of a similar kind to chemical combination. When impressions have been so often experienced in conjunction that each of

[1] This qualification meets the objection which might otherwise be raised to the term *inseparable*.

[2] 'Exam.,' I, 317. [3] 'Anal.,' I, 106. [4] *Loc. cit.*, § 3.

them calls up readily and instantaneously the ideas of the whole group, those ideas sometimes *melt and coalesce* into one another, and appear not several ideas but one." [1] Our idea of an orange really *consists* of certain ideas of color, form, taste, smell, etc., because by examination we can perceive all these elements in the idea. But we do not perceive, in the visual perception of the *shape* of an object, " that multitude of ideas derived from other senses, without which . . . no such visual perception would ever have had existence; nor in our idea of Extension can we discover those elementary ideas of resistance derived from our muscular frame, in which . . . the idea originates. These, therefore, are cases of *mental chemistry,* in which it is proper to say that the simple ideas generate, rather than that they compose the complex ones"[2]—just as when the spectral colors follow one another rapidly it is proper to say that they generate white, not that they *are* white.

J. S. Mill files two caveats in connection with the application of the notion of mental chemistry. First, when we see that some complex idea *may* have been generated in this wise from simpler elements, we should not assume at once that it actually *has* been—that the complex phenomenon has been satisfactorily explained: we must employ the canon of Difference as well as the canon of Agreement, and show that it could not have been brought about otherwise. Second, even if the association theory be proved, " we should not be the more enabled to resolve the laws of the more complex feelings into those of the simpler ones." [3] The generation of one class of mental phenomena from another does not supersede the necessity of an experimental study of the generated phenomena and their laws.[4]

[1] *Ibid.* [2] *Ibid.* [3] 'Logic,' *loc. cit.* [4] *Ibid.*

### 6. *J. S. Mill's Analysis of Belief*

J. S. Mill is concerned with association as a logician rather than as a psychologist, and he does not attempt to apply it systematically to the higher complexes as his father did. We need not stop to examine the minor emendations which are suggested in his notes on the 'Analysis,' since he is in general agreement with Bain's view, which will be discussed presently. But it is of interest to follow his analysis of Belief, which on account of its relation to judgment attracts his special attention in the 'Logic' and elsewhere.

Predication is not a mere case of naming, as the elder Mill declared; it is something more than the mere association of predicate with subject. Predication "expresses a belief that a certain coexistence or sequence of sensations or ideas did, does, or under certain circumstances would take place; and the reverse of this when the predication is negative." [1] Belief itself "is always a case either of memory or expectation." [2] It is the element which distinguishes memory from imagination, and expectation from mere conception.[3] Belief "is more than an inseparable association; for inseparable associations do not always generate belief, nor does belief always require as one of its conditions inseparable association" [4]—it certainly is not an *indissoluble* association, for then "an opinion once formed could never afterwards be destroyed or changed." [5]

There seems to be, then, some distinctive element in belief. Mill agrees with Bain that "what constitutes belief is the power which an idea has obtained over the will" by association.[6] "We believe a thing when we are ready to act on the faith of it—to face the practical con-

[1] 'Anal.,' I, p. 164.
[2] *Ibid.*, p. 418.
[3] *Ibid.*; *cf.* 'Exam.,' ch. 18, II, p. 97.
[4] *Ibid.*
[5] P. 404.
[6] 'Anal.,' I, pp. 402-3.

sequences of taking it for granted; and therein lies the distinction between believing two facts to be conjoined, and merely thinking of them together." [1] "But when there is a difference in the effects there must be a difference in the cause: the association which leads to action must be, in some respect or other, different from that which stops at thought." [2]

It is at this point that J. S. Mill differs with Bain, and questions the sufficiency of the associational analysis of belief: "I can perceive no escape," he says, "from the opinion that the distinction [between our representation of an imaginary thing and our belief in the reality of a represented thing] is ultimate and primordial. There is no more difficulty in holding it to be so than in holding the difference between a sensation and an idea to be primordial. It seems almost another aspect of the same difference." [3] And in his 'Logic,' also, he questions whether mental chemistry is adequate to explain the generation of belief.[4]

Mill's theory of belief plays an important role, as might be expected, in his epistemology. In two chapters of the 'Examination' he discusses at considerable length the psychological basis of our belief in the external world and mind. The external world reduces, psychologically, to a "permanent possibility of sensation." [5] My own mind reduces to "the permanent possibility of feeling," including internal feelings, thoughts, emotions, etc., as well as the sensations of my outward senses"; [6] it is a consequence of memory.[7]

Belief in the future enters as an important element into

[1] P. 403.
[2] P. 404. Compare the pragmatic doctrine of today.
[3] Pp. 412-3. An explanation of the relation between sensation and idea rests, as Hartley pointed out, on physiological grounds. It is difficult to see how physiological data can serve to explain the *sui generis* character of belief.
[4] Pt. VI, ch. 4, § 3.
[5] 'Exam.,' ch. 11, esp. p. 243.
[6] Ch. 12, pp. 253-4.
[7] 'Anal.,' I, p. 229.

our idea of causation. Mill defines a cause as an *unconditional* as well as invariable antecedent; it is not merely one that always *has* been followed by a given consequent, but one which we believe always *will* be so followed.[1] But our idea of cause includes another element, still more important than expectation—namely, the idea of *effort*. This latter datum is "derived from the action of our muscles," which always "has to contend against resistance, either that of an outward object, or the mere friction and weight of the moving organ; every voluntary motion is consequently attended by the muscular sensation of resistance, and, if sufficiently prolonged, by the additional muscular sensation of fatigue."[2] By constant association this experience is generalized, so that savages and children conceive inanimate causes as overcoming resistance, and this becomes their notion of *power*. While "we outgrow that belief," still our mind "interposes between the antecedent and the consequent an abstract entity to express what is supposed common to the animate and the inanimate agency," and "this purely subjective notion . . . is power."[3]

Mill assigns an important role to attention in connection with voluntary activity. Attention, produced by highly pleasurable or painful experiences, tends to prolong the experience so characterized, to strengthen it, and to render it more distinct.[4] When such an idea is associated with a muscular act, this intensification "has a specific tendency to excite the act when the idea is that of a pleasure, but when it is the idea of a pain has a specific tendency to prevent that act."[5] The power of the attention over the will, then, is not arbitrary, but an instance of the laws of association. This application of attention to the problem of volition, which Mill does not fully work out, is an important contribution to the theory of the

[1] 'Logic,' Bk. III, ch. 5, § 6. [2] 'Exam.,' ch. 16, II, p. 47.
[3] Pp. 47-8. [4] 'Anal.,' II, 372. [5] P. 380.

will from the associational standpoint, since it brings association to bear on conative phenomena in a new way, supplementing Hartley's general analysis.

Mill bases logic on the data of psychology, but declares that "logic is not the theory of thought as thought, but only as valid thought." [1] The so-called *laws of thought* (identity, contradiction, and excluded middle), which determine its validity, may or may not be "an original part of our mental constitution." Whether they "are laws of our thoughts by the native structure of the mind, or merely because we perceive them to be universally true of observed phenomena," he says, "I will not positively decide; but they are laws of our thoughts now, and invincibly so." [2]

The distinguishing features of J. S. Mill's work are (1) his emphatic reinstatement of mental chemistry as an operation attending certain associations, especially fusion; (2) his thorough analysis of belief, and his assertion that it contains an original element, not to be identified with sensation or idea, nor attributable to association; (3) his logical insight into many difficulties and shortcomings of the earlier associational analysis, his fair and incisive criticisms of these, and his many hints at more consistent solutions.

It is to be regretted that his psychological analysis is so detached and incomplete; but this disadvantage is scarcely felt if we take his system in connection with that of his father, amending the latter in accordance with his suggestions. Furthermore, we have a thorough analysis of consciousness by his contemporary and coworker Bain, whose point of view coincided in the main with John Stuart Mill's.

[1] 'Exam.,' ch. 20, II, p. 145.
[2] 'Exam.,' ch. 21, II, p. 180; *cf.* 'Logic,' Bk. II, ch. 7, § 5.

### 7. *Alexander Bain's Conception of Association*

Alexander Bain (1818-1903) for many years held the chair in logic at the University of Aberdeen, but is better known for his contributions to psychology. His book on logic is overshadowed by J. S. Mill's great classic, just as the latter's fragmentary psychology is dominated by Bain's exhaustive two-volume treatise. Bain's chief book on psychology appeared as two separate works, the first entitled 'The Senses and the Intellect' (1855), the second, 'The Emotions and the Will' (1859); they were twice revised by the author (3d ed. 1875). These two works, really one, embody Bain's conception of mind in a full and thorough analysis whose chief instrument is the associative principle. Some additional points and many side-lights are found in his notes to J. S. Mill's edition of James Mill's 'Analysis' (1869), and in his 'Mind and Body' (1866), his 'Mental Science' (1868), which is mainly an abridgment of his two first works, and his 'Logic' (1870). These later works and the revised editions of his earlier volumes show the influence of Herbert Spencer's evolution philosophy and Charles Darwin's theory of biological evolution in several respects; but Bain's psychology is essentially pre-evolutionary. His best piece of analysis is his treatment of the intellectual processes in terms of association, in his first volume.

Bain distinguishes at the outset between three sorts of mental phenomena: (1) feeling, including "pleasures and pains, emotion, passion, affection, sentiment"; (2) "volition, or the will, embracing the whole of our activity as directed by our feelings;" and (3) "thought, intellect, or cognition."[1] Intellect "includes such functions as memory, reason, judgment, and imagination."[2] It implies three facts: (1) "Discrimination, or sense of dif-

[1] 'S. and I.,' 3d ed., Intr., ch. 1, § 2.

[2] *Ibid.*, § 3.

ference, shown by our being conscious of one sensation as more intense than another," etc.; (2) "Similarity, or sense of agreement;" (3) "Retentiveness, commonly understood by the familiar names *memory* and *recollection;* this power is essential to the operation of the two former."[1]

Discrimination involves an important mental principle —the Law of Relativity: "As change of impression is an indispensable condition of our being conscious, or of being mentally alive to feeling and thought, every mental experience is necessarily *two-fold*. We can neither feel nor know heat, except in the transition from cold. In every feeling there are two contrasting states; in every act of knowledge two things are known together."[2] In his first edition Bain combines the first two factors together as "sense of agreement or of difference," and limits this phenomenon to intellect. The extension of discrimination to feeling and consciousness in all its forms, under the law of relativity, is an effect of Spencer's influence. It does not fit especially well into Bain's treatment of the laws of association, as L. Ferri points out.[3]

The third power, retentiveness, has two aspects: "the persistence or continuance of mental impressions after the withdrawal of the external agent," and "the power of recovering, or reviving, under the form of ideas, past or extinct sensations and feeling of all kinds, without the originals, and by mental agencies alone."[4] It is a striking feature of Bain's psychology that he dispenses with any treatment of *memory* as such; the nervous function of renewal is discussed briefly in one place,[5] the revival of sensations is alluded to under several senses, and the subjective phenomena of memory are treated mainly

[1] *Ibid.*
[2] 'S. and I.,' § 6; *cf.* 'Logic,' Intr., § 3.
[3] 'Psychol. de l'assoc.,' p. 138.
[4] 'S. and I.,' Bk. II, prelim.
[5] 'S. and I.,' Intr., ch. 2, § 25.

under the associative principle of contiguity.[1] The other "intellectual functions" of imagination, judgment, and reason are similarly subsumed as forms of association.

In his first edition Bain considers association as simply the revival or reappearance of past states of mind by mere mental operations.[2] The process "is subject to fixed laws . . . termed Laws of Mental Association, Suggestion, or Reproduction," which are "four in number, two being simple and fundamental, and two complex."[3] He names these principles Contiguity, Similarity, Compound Association, and Constructive Imagination.

In his third edition he links the law of contiguity with retentiveness, and the law of similarity with sense of agreement. The third law, which he terms Complicated Reproduction as well as Compound Association, and which seems to be derivative, he links with sense of difference or discrimination. Bain suggests no special basis for the fourth process, which involves "the applications of the intellectual forces to form new constructions, the Creative or Inventive faculty of the mind"; he is not disposed to treat it as a separate law.[4] This difference of treatment is a result of his attempt to incorporate the Spencerian principle of relativity into his analysis. Following the same plan, in the third edition he elevates discrimination to an important position at the outset and relegates it later on to a subordinate place under the law of contrast. This uneven treatment shows that his attempt is only partially successful—that he has not reconstructed his analysis thoroughly to accord with the new view, as should have been done in the interests of consistency. The four laws given in the first edition represent Bain's own standpoint.

(1) The Law of Contiguity, which is "the law of association proper, of adhesion, mental adhesiveness, or

[1] Bk. II, ch. 1.
[2] 'S. and I.,' Bk. II, prelim., § 6.
[3] *Ibid.*
[4] 'S. and I.,' 3d ed., Bk. II, prelim.

acquisition," is stated as follows: "Actions, sensations, and states of feeling, occurring together or in close succession, tend to grow together, or cohere, in such a way that, when any one of them is afterwards presented to the mind, the others are apt to be brought up in idea." [1] This law applies first of all to groups of muscular movements, and to the feelings which we have of such movements. It is the basis of our coordination of movements, and of our *idea of a movement* when the latter does not actually take place, a type of intellect or thought which appears at an early stage. In like manner sensations arising from the same sense group themselves into *objects of sense,* and give rise by association to ideas, though this usually occurs in the higher senses only. A later form is the grouping of sensations from different senses and of sensations with movements, which gives rise to perception and *ideas of objects of perception.* These 'object-experiences,' again, may be associated with emotions (sublimity, etc.) or with movements (volition). The law of repetition, according to which the strength of an association is increased by its frequent renewal, is implied in the law of contiguity.[2]

Bain believes that most cases of association are successive—all, in fact, "except complex and coinciding muscular movements, and the concurrence of sensations through different senses at the same moment." [3] "The features of a landscape can be conceived only by successive movements of the mind, as it can be seen only by successive movements of the eye." [4] In this way he sets aside in large measure the problem of simultaneous association and the question of fusion.

(2) Bain's other fundamental principle is the Law of Similarity or Agreement: "Present actions, sensations, thoughts, or emotions tend to revive their *like* among

[1] 'S. and I.,' 1st ed., Bk. II, ch. 1, § 1.
[2] *Ibid.*, § 1.
[3] *Ibid.*, § 58; *cf.* 'M. S.,' 112.
[4] *Ibid.*

previous impressions." [1] Under the first law "the new action or the new image was supposed precisely *identical* with the old, and went simply to reinstate and to deepen an impression already made"; the second law applies to cases "where the identity is only partial." [2] In the first case the reinstatement is sure, here it is doubtful, and the problem is what degree of similarity will produce association. When two experiences are alike in one respect and dissimilar in many, it is possible to detect the similarity in some cases and not in others. Faintness and diversity are impediments to the revival,[3] and familiarity a help,[4] under this law. The rational processes of abstraction, induction, deduction, and analogy are instances of association by similarity.[5]

(3) Bain's third principle is the Law of Compound Association; "Past actions, sensations, thoughts, or emotions are recalled more easily when associated, either through contiguity or similarity, with *more than one* present object or impression." [6] This is not a new principle; the reinstatement according to the two fundamental laws merely becomes "more easy and certain" where "several threads, or a plurality of links or bonds of connection concur in reviving" one and the same previous mental state.[7] "Associations that are individually too weak to operate the revival of a past idea, may succeed by acting together." [8]

Bain's exposition of this principle is scarcely satisfactory; his instances are for the most part complexities which have been already associated, rather than separate experiences—or the association is traced to frequency rather than concurrence. He does show, however, that trains of thought are directed into one rather than the other of two conflicting lines by the relative number of

[1] Ch. 2, § 1. [2] *Ibid.*, § 2. [3] § 4.
[4] § 9. [5] § 34. [6] Ch. 3, § 1.
[7] *Ibid.* [8] *Ibid.*

the favorable elements in the present experience as well as their strength.[1]

In his first edition Bain reduces Aristotle's law of Contrast or Contrariety to a combination of contiguity and similarity, together with an element of emotion which serves to impress the contrast upon us. Black and white, for example, are both colors, or modes of light; having become coupled in popular language, they tend to suggest one another by contiguity; while in many instances of contrast one quality is painful and suggests the other as a relief from this.[2] In the revised edition he makes contrast "the reproductive phase of the first law of mind —relativity or Discrimination,"[3] while admitting that contrast may also arise in many cases in the ways just stated.

(4) The fourth principle, Constructive Imagination, is stated as follows: "By means of association the mind has the power to form new combinations or aggregates, *different* from any that have been presented to it in the course of experience."[4] This operation is variously known as Imagination, Creation, Constructiveness, and Origination or Invention; it is the process whereby we put together new forms of mental imagery. Bain affirms that "the intellectual forces operating in these creations are no other than the associating forces already discussed; the new combinations grow out of elements already possessed by the mind, and brought forward according to the laws above laid down."[5]

### 8. *Bain's Derivation of Mental Phenomena*

Bain reduces all the intellectual processes to instances of one or other of these laws or forms of association. In

[1] § 14.
[2] *Ibid.*, § 18.
[3] 'S. and I.,' 3d ed., *ibid.*; *cf.* 'Mental Sci.,' Bk. II, ch. 3, § 10.
[4] 'S. and I.,' 3d ed., Bk. II. ch. 4, § 1.
[5] *Ibid.*

general, *perception* and *memory* result from the principle of Contiguity, *generalization* and all forms of *reasoning* result from the principle of Similarity or Agreement; complex experiences of objects are consolidated and habitual trains of thought are formed in accordance with the principle of Compound Association; while imagination and invention result from the principle of Constructive Association. "The principal distinction between memory and imagination lies in the *setting* of the respective ideas: ideas of memory have a place in the continuous chain of our remembered life; ideas of imagination correspond to nothing in that chain—or rather, they are consciously combined from different ideas of memory taken out of their memory-setting and aggregated under a special motive." [1]

Knowledge is identical with affirmation and belief. Its essential elements are, (1) in the case of a single thing known, "we must be conscious of it as *differing* from some things and as *agreeing* with others"; (2) in the case of affirmations, at least two things are noticed, and "the couple must be farther viewed as coming under a third property," such as coexistence, succession, etc.; (3) "into these affirmations there must enter the active state or disposition termed belief, or disbelief." [2]

Belief is essentially a part of the active side of mind. "Preparedness to act upon what we affirm is . . . the sole, the genuine, the unmistakable criterion of belief." [3] In its primitive form it is primitive credulity and spontaneous activity—the impulse to accept experience without question and to act upon it; but even early in experience there appear contradictions, which produce depressing emotional effects. Owing to these contradictions, belief in its developed form implies "as a necessary element some cognizance of the order of nature." [4] In a

[1] 'Em. and Will,' 3d ed., ch. on Belief, § 29.
[2] *Ibid.*, ch. Consc., § 26. [3] Ch. Belief, § 2. [4] § 3.

word, belief proper is "innate credulity tempered by checks."[1] Our beliefs are strong in proportion (1) as "we work as strongly for the means as we do for the end" (motor test), and (2) as we are elated "by attaining the means to a given end," or depressed "by a prognostic of calamity"—emotional test.[2]

Contrary to J. S. Mill, Bain finds no new and unanalyzable element in belief; he is able to reduce it to a case of association. His position is virtually in agreement with that of the elder Mill, except that he makes non-contradiction the test of belief: we assume that the uncontradicted is true—not merely that which has been incessantly repeated.[3]

Bain's analysis of the distinction between subject and object, between the internal and external worlds of experience, forms an interesting contrast with J. S. Mill's. He finds that these two sides are separated in experience by three independent criteria: (1) Objects are characterized by "movement . . . as contrasted with passive sensation" which characterizes the subject. (2) "Definite feelings connected with definite movements" characterize the object, in contrast with "feelings independent of our movements (subject)." (3) "Experience common to all (object), as against experience special to each (subject)."[4] The fundamental experience connected with movement of objects, in the first criterion, is "that peculiar sensibility that we term the *feeling of resistance,*" which he attributes to the muscle sense. The second criterion forms the demarcation between sensation and idea. The third he regards as "one of the handiest tests to distinguish reality from illusion."[5]

We noticed that Bain places the active side of mind ahead of the intellectual in his opening analysis. This order has peculiar significance in his system. Perhaps

[1] § 21. [2] § 5. [3] § 22.
[4] *Ibid.*, ch. Consc., § 28. [5] *Ibid.*

the most important feature in his treatment of the elementary facts of psychology is the prominence he accords to motor phenomena, starting with the notion of contractility and sensibility, and examining all forms of spontaneous and instinctive activity in connection with the feelings that accompany them. His theory of volition hinges on this relation.

The primitive fact of mind on its motor side is the original tendency of the organism to spontaneous movements.[1] For the passage from spontaneous to voluntary activity, it is necessary (1) that certain movements, or groups of movements, be capable of *isolation* from all others; and (2) that there be some special *excitement*, especially by what may be termed mental stimulants or ideas.[2] The link between feeling and action in primitive life is the law of self-conservation: pleasurable stimuli tend to incite greater activity, while painful stimuli tend to check activity.[3]

The special stimulus to voluntary activity is directive, and consists in an ideal "purpose or aim."[4] Ideas come under voluntary control by the hindering effect on movements of certain thoughts and the furthering effect of others.[5] The sense of voluntary *power* arises in the consciousness of effort, which is the consciousness of expenditure of energy in the struggle against obstacles; its growth is due to exercise and fatigue: the repetition of chance conjunctions of movements with ideas which are favorable to the coordinated activity generates an association (law of contiguity), while irrelevant accompanying movements only hinder the consolidation till by chance they are omitted and the obstacle to complete coordination is overcome.[6] Ideas so joined with coordinated activity are known as motives or ends.

[1] 'Em. and W.,' Bk. II, ch. 1, prelim. [2] §§ 3, 4.
[3] 'S. and I.,' Bk. I, ch. 4, § 26. [4] 'Em. and W.,' Bk. II, ch. 1, § 6.
[5] § 8. [6] *Ibid.*, ch. 2, §§ 1, 2.

Motives admit of a variety of classifications, the most fundamental division being into ideas concerned with the promotion of pleasure and those concerned with the warding off of pain.[1] Conflicts in motives arise from the joint presence of two or more motives that tend toward different lines of activity; deliberation is the check or pause during this conflict, and resolution marks its termination.[2] The moral instincts are habits of control which arise according to the laws of association, aided by social education; [3] the notions of duty and conscience depend at first on punishment and the fear of punishment, which are later superseded by a subjective control—the former stage is the slave conscience, the latter the citizen conscience.[4]

Bain regards volition as a *mental* phenomenon, but not as a fact of *consciousness*. The elements in consciousness corresponding to volition are either intellectual or emotional; deliberation, desire, and belief, as facts of experience, are *ideas*.[5]

Emotions, according to Bain, are complex manifestations of feeling. The direct external stimulus, which is the prominent physical element in sensation, is lacking in emotion, and in its place we find the " outward manifestations or diffused wave of effects." [6] This tendency of the aroused currents to diffuse themselves is a characteristic of all feeling, but in the case of emotion it is more extended and definite than in the simpler pleasure or pain reactions.[7] Associations founded on feeling are the slowest to form and require most repetition;[8] on the other hand the complex feelings or emotions aroused by association attain a greater intensity or volume and subside more gradually than ideational associations.[9] Bain analyzes the emotions as developments of primitive pleas-

[1] Ch. 5.
[2] Ch. 7.
[3] Ch. 9.
[4] Ch. 10.
[5] 'Em. and W.,' ch. Consc., § 6 note.
[6] 'Em. and W.,' Bk. I, ch 1, § 2.
[7] *Ibid.*, § 3.
[8] § 16.
[9] Ch. 3, § 3.

ure and pain; the chief types are love, anger, and fear, the lowest form of love being sympathy, which differentiates into the social, sexual, and parental emotions, etc.

To sum up the main points in Bain's position. (1) The key to his psychology is found in the relation which he assumes between experience and motor impulse. Previous writers regard sensation as an effect or consequent of stimulation. Bain not only accepts this view, but makes the further assumption that sensation, or its nervous correlate, is accompanied by a direct motor tendency of some sort, and that this motor impulse is more pronounced the stronger the feeling element in the experience.

(2) Discrimination, the elemental fact of intellect, is an original element in all experience, for consciousness itself implies change, and change involves primitive discrimination. This theory was borrowed from Spencer after Bain's work first appeared, and is not thoroughly incorporated into his analysis in the later editions.

(3) The revival of impressions without renewal of the external stimuli, resulting in ideas, is a fact explicable in physiological terms, and its psychological formulation appears in the Law of Association. All varieties of intellectual experience and all trains of thought result from discrimination and revival according to the associative principles of contiguity and similarity. This is brought out in a very searching analysis.

(4) Motor coordination and voluntary control result from the association of ideas with motor impulses according to the same laws. Chance unions and repetitions of favorable unions guide the coordinations into the proper channels. 'Volition' is not a fact of consciousness, however; the consciousness of effort, deliberation, desire, and belief are ideas, not a new type of experience.

(5) The emotions are traceable to complications of primitive feeling, motor impulse, and discrimination.

(6) The fundamental facts of consciousness thus appear to be (*a*) primitive feeling—sensation, as pleasure, pain, or neutral; (*b*) discrimination, or relativity of consciousness, which includes sense of similarity; and (*c*) associative revival, in the form of ideas. No other elements are needed, except the laws of the physical organism.

### *9. Culmination of Pure Associationism*

Bain develops his analysis along rigidly associational lines. Even belief, in which J. S. Mill finds an irreducible element, is traced to associative principles. He emphasizes the sequential character of consciousness; with few exceptions all experiences are successive, and consequently he finds no cases of simultaneous association. Thus he avoids dealing with the question of coalescence and mental chemistry. Apparently he accepts, with James Mill, the mechanical view of association—or at least does not accept the 'chemical analogy.' The elder Mill, however, believes in simultaneous association, which makes the mechanical character of his theory apparent, whereas there is nothing in Bain's analysis inconsistent with 'mental chemistry' if his few instances of simultaneous experiences should necessitate the extension of association to synchronous intellectual experiences.

Bain follows Hartley in laying stress on the nervous system and its functions. A long chapter is devoted to details of anatomy and physiology of brain, nerves, sense organs, and muscles. In this he appears to have set a pattern for many recent psychological treatises. His analysis of sensation is as full as James Mill's is brief, and he is a forerunner in this respect of the modern experimental movement.

Bain's work marks the culmination of the 'pure' associationist movement. The introduction of the conception of evolution into science wrought a change in the problem

of mental growth, involving a reconstruction, or at least a restatement, of the notion of association. Bain's relation to this new trend in psychology will be discussed in the next chapter.

Before passing to the last phase of associationism we should notice briefly three other writers who belong to this period.

Samuel Bailey (1791-1870), a writer on psychology, logic, and economics, in his 'Letters on the Philosophy of the Human Mind' (1855-1863) vigorously attacks the 'faculty' interpretation of mind. His empiricism leads him to question the Berkeleyan theory that distance perception is an inference.[1] According to Bailey it is rather an associative experience of the same sort as the union of sensory data in other perceptual experiences.

John Daniel Morell (1811-1891) developed an empirical system of psychology in two works, 'Elements of Psychology' (1853) and 'Introduction to Mental Philosophy' (1862). While adopting the associational standpoint in the main, he was largely influenced by Herbart. According to Morell similar ideas 'blend,'[2] while the term association applies to the sequence of ideas.[3] The strength of an association, according to Morell, may in every case be stated as "equal to the amount of the action and reaction of the associated ideas."[4]

James Sully (b. 1842) belongs in the main to the Scottish movement, but lays great emphasis on the associative process. In his 'Outlines of Psychology' (1884), while adopting the 'faculty' psychology, he accords first place to *association* under the laws of mind.[5] He discusses the laws of association at considerable length,[6] following Bain's treatment in the main.

[1] 'Review of Berkeley's Theory of Vision,' 1842.
[2] 'Intro.,' Pt. III, ch. 3.
[3] *Ibid.*, ch. 4. [4] *Ibid.*, p. 177. [5] Pp. 29-36. [6] Pp. 227-75.

Sully's later work, 'The Human Mind' (1892), devotes more space to experimental and psychophysical results, but his general standpoint remains the same. He is not influenced by the evolution doctrine. In this work Sully adopts the notion of mental chemistry,[1] and follows Bain in his general treatment of association. Sully formulates a new law of association, which he calls the Law of the Dominant Element: "Where associative cohesion of two or more psychical elements is strong, the characters of dominant elements tend to be distributed over the whole compound."[2]

[1] Vol. I, p. 190.

## CHAPTER III

## EVOLUTIONARY ASSOCIATIONISM

### *1. The Evolution Concept in Psychology*

BAIN occupies a peculiar position in psychology. He had worked out his analysis along pure associational lines and had published his results while still under the influence of the older world-view, which held to the permanency of biological species. The theory of fixed *organic types* carries with it the view that the *mental constitution* of each species is also fixed and changeless; hence the only sort of mental growth to be considered is the development of experience which arises from the action of the environment on the individual. The debate between 'nativists' and 'empiricists' seemed to resolve itself into a question whether the 'original constitution' with which each individual begins life is in the nature of *structure* (innate ideas, mental forms, etc.), or of *dynamic conditions* (laws of association, etc.). The nativists provided the new-born infant not with actual mental currency, but with drafts payable to bearer at sight; the associationists started him off in life with neither money nor drafts, but merely with an introduction to the bank, and compelled him to work his way to mental wealth according to the laws of associational economics.

Just as Bain was publishing his first volume, Herbert Spencer issued in its earliest form his work on 'Psychology' (1855); and in the year in which Bain's second volume appeared Charles Darwin published the 'Origin of Species' (1859), and Spencer was beginning to outline

his evolution philosophy. The effect of the evolution concept on psychology was to reveal a possible intermediate position between the two conflicting schools. The *individual biological organism,* as even the ancients had observed, starts life with certain organs already formed in embryo and ready to function at birth; but according to the evolution theory the form of these organs is the result of a gradual process of modification and increasing complexity which occurs in race history. Similarly the *individual mind* may be pictured as starting in upon its independent career at birth with certain innate grounds of experience, which are likewise the result of a gradual formative process operating through actual experience in race history. This application of the evolution theory to psychology gave the *a priori* school a nominal victory, since its contention was literally substantiated; but empirical psychology came off with the real honors, since its protest against 'innate forms' was validated in the wider field of race history.

Adopting the evolution view, other factors besides association might be introduced into an experience psychology. Such biological concepts as plasticity and fixity, rudimentary appearances and vestigial remnants, chance and determinate variation, the lapsing of intermediate links, etc., translated into psychological language, have a wider importance when applied to the growth of the mind in the race than when limited to the individual. The relation of sensation to idea and the interplay of sensation and motor impulse require description along broader lines, in terms more analogous to the language of biology. The whole science of social psychology, including social data and social transmission, comes into being or at least attains maturity. On the other hand, these factors might easily be passed over. The association psychology might be transferred bodily to the new world-view with scarcely an alteration, by a mere change of emphasis at certain

points from the development of individual experience to the evolution of experience types.

The latter was what actually occurred in Bain's case. Though he adopted the evolution theory and revised his two earlier volumes in accordance with it, there are few changes of fundamental importance in the later editions of these works; while many of the changes which he did make, notably those due to his acceptance of the doctrine of relativity, were not directly due to the requirements of the new view. Although Bain adopts the evolution view in all but his first works, his system does not bear the marks of having been vitally affected by it. He stands by the older 'mechanical' viewpoint. His conception of association and its principles is based on the analogies of the physical sciences, rather than on biological analogies.

Spencer and Lewes, though one was born only two years later and the other a year earlier than Bain, both belong to a later generation in thought. They had assimilated the notion of evolution before undertaking their analysis of mental phenomena. Their psychology is the historical successor of the older associationism; but it re-examined the empirical standpoint and interpreted association in terms of evolution. They attempted a new analysis of consciousness and broadened its foundation to include many principles borrowed from the biological field. The evolution psychology, as worked out by Spencer and Lewes, is based essentially on the biological analogy. It is 'mechanistic' only in the widest sense of the term—not *physical,* like the associationism of James Mill and Bain, nor *chemico-physical,* like that of the other earlier associationists, but *bio*-chemico-physical. However we interpret their theory of being, their psychology is based on laws derived from the objective sciences, rather than on laws of a new and peculiar type; the pattern of these laws is found in the organic sciences

first of all, and only secondarily in the laws of the inorganic world.

### 2. *Herbert Spencer's Psychological Standpoint*

Herbert Spencer (1820-1903), a civil engineer in his younger life, relinquished this calling in 1847 for philosophy and science; he conceived about 1858 the notion that all cosmic phenomena constitute an evolution from "an indefinite, incoherent homogeneity to a definite, coherent heterogeneity." Abandoning practically every other work he devoted forty years to the formulation of the laws of this evolutionary process and to elaborating their details in biology, psychology, sociology, and ethics.

Spencer's 'Principles of Psychology'[1] being part of his larger 'System,' its starting-point is naturally the phenomena of organic life already dealt with in the preceding volumes on the 'Principles of Biology.' Nervous activity is a particular mode of motion and conforms to the physical laws of integration. "The actions of all organic beings, including those of our own species, are known to us only as motions."[2] When we study our own actions, however, there lies before us a class of facts absolutely without any perceptible or conceivable community with the facts revealed as nervous activity; the phenomena of consciousness are truths of which the very elements are unknown to physical science. Objective observation and analysis fail us, and subjective observation and analysis must supplement them. The changes which have been expressed in terms of motion have now to be expressed in terms of feeling.[3]

[1] First ed., 1855, in one volume; 2d ed., 1870, essentially rewritten, in two volumes; 3d ed., enlarged, 1880.

[2] 'Pr. of Psychol.,' 3d. ed., Pt. I, § 7.

[3] *Ibid.*, § 41. In this and other passages cited, Spencer's own language is partly quoted and partly paraphrased. Full quotation is impracticable on account of the elaborate qualifying clauses introduced which are not essential to the present discussion.

Thus at the outset Spencer thrusts aside the materialistic hypothesis. According to him the two series, neural change and feeling, though absolutely different in sort, bear a quantitative relation to each other when all other things remain the same; this relation he expresses in terms of direct proportion, not according to the formula of Weber's Law.[1] The ultimate unit of consciousness is 'little else than a nervous shock,'[2] using that term in a subjective sense—not as molecular motion. Starting with this primordial element of consciousness, "the countless kinds of consciousness may be produced by the compounding of this element with itself and the recompounding of its compounds with one another in higher and higher degrees—so producing increased multiplicity, variety, and complexity." It is probable that "all the unlikenesses among our feelings result from unlike modes of integration of this ultimate unit."[3]

Spencer reduces the elements of which mental phenomena are composed to "two broadly-contrasted kinds —*feelings* and the *relations between feelings*."[4] The term *feeling* as he uses it is equivalent to any definite experience or state of consciousness. He divides feelings into three main classes according to their source: (1) *Centrally initiated* feelings, or emotions. All others are peripherally initiated, and are termed sensations; but they differ according as they originate in nerves whose endings are within the body or at its outer surface. The former give (2) *entoperipheral* feelings, which, though not peripheral in an anatomical sense, are physiologically peripheral, since they do not imply outer agencies. The latter give (3) *epi-peripheral* feelings, which are peripheral in every sense of the term, and imply outer agencies as stimuli.[5] Feelings of all three classes are di-

[1] § 47. [2] § 60. [3] *Ibid.* [4] § 65.
[5] § 66; *cf.* § 112. These three classes correspond roughly to the recent division into interoceptors, proprioceptors, and exteroceptors respectively.

vided into *primary* and *secondary,* by the criterion of vividness.[1] The primary feelings are those vivid states of consciousness which we know as sensations and emotions; the secondary are the faint states of consciousness which we know as remembered sensations or ideas of senations, and remembered or ideal emotions.[2] Vivid feelings have a tendency " to cohere with the faint forms of all preceding feelings like themselves "; such combinations are known as *ideas,* and are the units of knowledge.[3]

The *relations between feelings* are due to " the passage from one apparently-uniform state [of feeling] to another apparently-uniform state, implying the momentary shock produced by the commencement of a new state." [4] They occupy no appreciable part of consciousness, since they disappear if we take away the terms which they unite.[5] The relations between feelings may be classified as relations of *coexistence, sequence,* and *difference,*[6] but they reduce in the last analysis to relations of *difference* and *no-difference.*[7]

The secondary or faint feelings may be regarded on the physiological side as *revivals* of corresponding primary states.[8] Spencer finds that feelings of the different classes are revivable in proportion as they are relational.[9] Visual sensations are the most revivable on this account, auditory come next, etc.[10] " The revivability of a feeling varies with its strength," and " with the number of times it has been repeated in experience." [11] Relations are more revivable in general than feelings.[12] Among other laws of revival, Spencer finds that present feelings of extreme vividness interfere with the revivability of past feelings, especially of feelings of the same order; for instance, a present visual sensation interferes with the revival of a visual image,[13] and in like manner presented relations

[1] *Ibid.* [2] § 49. [3] § 73. [4] § 67.
[5] § 65. [6] § 89. [7] § 93. [8] § 96.
[9] § 97. [10] *Ibid.* [11] § 99. [12] § 105.
[13] § 98.

hinder the representation of other relations, but in a lesser degree.[1]

Summing up, Spencer divides states of consciousness into two classes—*feelings* and *cognitions*, the latter being states which correspond to the relations of feelings. Feelings consist of (1) presentative feelings, or sensations; (2) presentative-representative feelings, embracing a great part of what we commonly call emotions; (3) representative or ideational feelings, namely, the *ideas* of the two first classes of feelings; and (4) re-representative feelings, the most complex states of all, which include the higher sentiments, such as justice, etc. Cognitions fall into four corresponding classes, in which consciousness is occupied with *relations* of the feelings of these respective sorts.[2]

### 3. *Spencer's Interpretation of Association*

The phenomenon which has been treated up to this point as *nervous revivability* and *coherence*, may be regarded from another aspect as *association*. According to Spencer, cohesions may be otherwise described as associations, and, other things equal, revivability varies as associability.[3] "On the one hand, we know feelings to be associable only by the proved ability of one to revive another," and "on the other hand, the revival of any feeling is effected only through the intermediation of some feeling or feelings with which it is associated. Hence, the conditions that favor revivability are those that favor associability."[4] As already noted, this revivability or associability is in proportion as the states in question are relational. Emotions being less relational than sensations, they are less revivable or associable than sensations; and of the latter the ento-peripheral are less relational, revivable, and associable than the epi-peripheral.

[1] § 107. [2] § 480. [3] § 111. [4] § 112.

Epi-peripheral feelings, which are sensations due to external stimuli, even when they occur together or in succession only a few times become linked in such a way that the vivid or the faint form of one arouses the faint forms of the rest.[1]

Association involves two problems: (1) the association of feelings, both vivid and faint; and (2) the association of the relations between feelings.[2]

As regards the association of *feelings*, Spencer believes that its only mode is the "cohering of each feeling with previously-experienced feelings of the same class, order, genus, species, and, so far as may be, the same variety."[3] In other words, the only direct association of feelings is the association of some *present* sensation or emotion or idea with preceding feelings like itself. All other associations of feelings are indirect and are due to the association of relations. The direct association of a sensation with its idea, that is, the phenomenon of revival, is automatic; it is "not an act of thought that may or may not take place, but constitutes the very recognition of each feeling."[4] Neurologically, "it answers to the re-excitation of the particular vesicle or vesicles which, when before excited, yielded the like feelings before experienced."[5]

Association of relations follows the same law as the association of feelings: Every relation, on being presented to consciousness, associates itself with like predecessors;[6] that is, each recalls its own class and subclass of relations.[7] Thus, when a sensation occurs in a relation of coexistence with another sensation (as when we see two things simultaneously), not only is the sensation in question automatically associated with its corresponding idea, but the relation of coexistence also automatically classes itself with relations of coexistence in general.[8] Coexistence, especially of the visual type, is the most relational,

[1] *Ibid.* [2] § 113. [3] § 115. [4] *Ibid.*
[5] § 116. [6] § 120. [7] § 119. [8] *Ibid.*

and hence the most associable relation; [1] "any coexisting positions visually presented are immediately associated in thought with the cluster of coexisting positions similarly related to us." [2] Relations of sequence are associable into simple combinations with considerable facility, though with less facility than coexistence; and there is considerable associability of coexistence with sequences.[3] The association of relations "leads by perpetual repetition to indissoluble connections in consciousness, which govern our thoughts absolutely." [4]

Spencer concludes that "knowing a relation, as well as knowing a feeling, is the assimilation of it to its past kindred; and knowing it completely is the assimilation of it to pass kindred exactly like it." [5] The association of coexistent or successive *feelings,* in fact, is due to the association of coexistent or successive *relations,* since it is the result of an association of spatial or temporal relations; and this is true not only of simple feelings and their relations, but also of any plexus of relations among many feelings.[6]

This is the basis, then, of the so-called law of Association by Contiguity. When we analyze it, contiguity resolves itself into *likeness* of relation in time or space or both.[7] In other words, according to Spencer the association of one experience with another is the *revival* of an experience corresponding to the given one, in the form of an idea; and the association of relations among experiences is the *revival of relations* like those involved in the given experience. Unlike experiences, though contiguous, are associated only through the revival of like experiences, or through revival of the temporal and spatial relations which constituted the basis of their contiguity in some earlier experience.

It is important to notice here a change in terminology

[1] § 118. [2] § 119. [3] § 118. [4] *Ibid.*
[5] § 120. [6] *Ibid.* [7] *Ibid.*

introduced by Spencer which, though slight, radically altered the complexion of the association problem for him. What Spencer calls *relation of feelings,* is precisely the phenomenon which associationists generally have called *association;* and what he terms *association* and reduces to the fact of automatic revival, is classed by preceding writers as an original datum of the mental life (*idea*). His predecessors regarded ideation not as a form of association, but as one term in the associative process.

From Spencer's standpoint the leading task of psychology is to account for ideational revival. Assuming that the primitive data of psychology are *feelings,* which are due to direct action of stimuli on the nervous system, in what manner are *revivals* (faint copies of these originals) produced by central excitation without direct action of the original stimuli? This is Spencer's conception of the association problem. For his predecessors the problem was to account for the unity and complexity of experience. Assuming that the data of experience are *sensations* and their copies (*ideas*), how do these data come to be united into simultaneous 'complexes' and into successive 'trains'? The concept of association was the instrument used to solve the difficulty.

While Spencer by means of his revival theory explains perhaps more satisfactorily than earlier writers the physiological grounds of the ideation process, he does not throw much new light on the problem of complex experiences. He merely assumes an additional principle of union (which they included under association) in the guise of *relations of feelings.*[1] This union of the rela-

[1] It is difficult to understand just what Spencer means *psychologically* by his relations of feelings—whether he would regard them as 'data of experience,' like sensations, or 'mental forms,' such as Kant postulated. His *physiological* explanation of their occurrence is clear enough, but his discussion of their mental character seems vague. (See §§ 65, 67, 70-4.)

tional type is quite distinct from revival, nor does he analyze its laws as fully as some of his predecessors.

In fact, Spencer overlooks what most associationists consider the fundamental problem of psychology. Take any ordinary state of consciousness in the adult human experience; we find that it consists in a complex of sensations and ideas; their 'unity' as a single present experience is a *joining together* (a conjunction, relation, or association) of some sort, or a multiplicity of such joinings, according to the associational view. The chief problem, according to these writers, is what produces this *unity* of consciousness, rather than how certain of the constituents come to be *revivals of past experiences* or of past unions. The repetition of an experience, whether sensation or idea, leads to the successive renewal of certain elements which belonged to former similar experience but which do not appear in the present experience at the outset; they become joined to it or succeed it *because* they were formerly united to its like, either coexistently or successively (law of contiguity).

How comes it, then, that coexistent or successive elements are *experienced together* in one complex, unitary experience? This is the fundamental problem of the associationists. Brown simply assumes this unification as a fundamental and inexplicable fact; Hartley endeavors to show the physiological accompaniments of the process. But whatever the solution, the question is a crucial one for any empirical psychology. Spencer's postulate of relations of feelings affords the empiricist little direct help, though his theory of revival helps considerably by implication.

Important in its bearing on the law of association is Spencer's discussion of coexistence and succession. "Psychical life is distinguished from physical life by consisting of *successive changes only*, instead of successive and simultaneous changes. . . . Though a visual

impression makes us nascently conscious of many things, yet there is always some one thing of which we are more conscious than of the rest. . . . Though the images of other things are all the while being impressed on the retina and are producing changes there, yet these are not appreciated internally—are scarcely more than physical changes—do not undergo that coordination with others which constitutes them psychical changes. . . . While the outer strands of changes which constitute the thread of consciousness are indefinite and loosely adherent, there is always an internal closely-twisted series of changes, forming what we may consider as consciousness proper." [1] Psychical changes, then, are relatively speaking *serial*, "and in proportion as they assume that most developed form constituting rationality they cohere into a seemingly-single succession of states. Though these states are physiologically composite, and were once psychologically composite, yet, to the extent that they have become consolidated elements of thought, they may rightly be regarded as severally simple." [2]

Spencer formulates three laws governing the *degree* of associability of experiences, which he bases on characteristics of the underlying physiological processes. (1) *Vividness:* "The connection formed between two feelings or ideas that occur together or in succession is strong when they are vivid and feeble when they are faint." (2) *Repetition:* "Repetition of the relation between two states of consciousness, presentative or representative, strengthens their union." (3) *Decreasing gain:* "For some time recurrences of a sequence go on appreciably increasing the readiness with which the antecedent excites the consequent; but the increase gradually becomes less and less appreciable." [3]

To sum up, Spencer regards association as the *revival* of similar experiences. To this type he adds another

[1] § 180. [2] *Ibid.* [3] § 250.

form of union, the *relation* of experiences, which is the juncture of contiguous experiences. In the higher manifestations of consciousness this contiguity tends more and more to the form of succession, with corresponding loss on the side of coexistence.

### *4. Derivation of Higher Mental States*

The derivation of the higher mental states is examined by Spencer in Part IV of his ' Psychology,' under the title of Special Synthesis. He starts with *reflex action* as the lowest form of psychical life—the " most nearly related to physical life "; [1] it is the sole form observed in the lowest animal species, and constitutes the lowest type of mental process found in higher organisms. Reflex action is specially characterized by *simultaneity:* as in the case of physical transformations, " a great number of these simplest nervous changes go on quite independently in the same organism at the same moment." We find them occurring in ourselves without consciousness.[2]

The next higher form, *instincts,* includes compound reflex actions,[3] in which the diffused simultaneous changes are transformed into concentrated serial changes.[4] In its higher forms, instinct is probably accompanied by a rudimentary consciousness.[5]

Memory arises when the stimulus is so complicated that the nervous center cannot receive all the impressions at the same instant; it follows that the different impressions, being severally supplanted by one another, " will each of them consist of an incipient or faint form of that nervous state which would have accompanied the actual motor change had it occurred. But such a succession of states constitutes *remembrance* of the motor changes which thus become incipient—constitutes a *memory.*" [6] In conjunction with this motor memory there

[1] § 192. [2] *Ibid.* [3] § 194.
[4] § 195. [5] *Ibid.* [6] § 200.

occurs in the organism at the same time and by the same process a memory of those combinations of impressions which it receives through the senses. "Of the impressions produced by adjacent objects during the movements of the organism, each is apt to make nascent certain other impressions with which it has been connected in experience —calls up *ideas* of such other impressions; that is, causes a remembrance of the attributes previously found in connection with the perceived attributes. As these psychical states have in their turns been connected with others, they tend to arouse such others; and thus there arises that succession of ideas, partly regular, partly irregular, which we call memory." [1]

There is no hiatus, according to Spencer, between instinct and reason; rational action, like instinctive action, is an adjustment of inner relations to outer relations. In reason, however, "the correspondence is between inner and outer relations that are complex, or special, or abstract, or infrequent." [2] Consequently, the direction of association or union is more determinate. Each experience comprised in a complex group resembles previous complex experiences in some ways, "yet it has presented some attributes which they did not present, and has not presented others which they did present." Hence, when such a complex group appears, "the ideas of one or more unperceived attributes will be aroused"; that is, they will appear as nascent states of consciousness—they are said to be *inferred*.[3] This is typical of all forms of rational process.

"Beginning with reasoning from particulars to particulars—familiarly exhibited by children and by domestic animals—the progress to inductive and deductive reasoning is similarly unbroken, as well as similarly determined. And by the accumulation of experiences is also determined the advance from narrow generalizations

[1] *Ibid.* [2] § 203. [3] § 205.

to generalizations successively wider and wider." [1] Classification, naming, and recognition are special types of inference, all based on the idea of likeness or similarity.[2]

"Other things equal, the cohesion of psychical states is proportionate to the frequency with which they have followed one another in experience." [3] This Law of Frequency supplies an explanation of the so-called *forms of thought* and of our ideas of space and time, if it is supplemented by the law that habitual psychical successions entail some *hereditary tendency* to such successions —which, under persistent conditions, will become cumulative in generation after generation.[4] These predetermined internal relations constituting our ideas of space and time and the laws of thought, though independent of the experiences of the individual, are not independent of experiences in general: they have been determined by the experiences of prior-existing organisms.[5]

Spencer traces the higher development of feeling and of will in much the same way. Volition arises as follows: When the automatic actions become so involved, so varied in kind, and severally so infrequent, as no longer to be performed with unhesitating precision, action is delayed, and there is constituted a state of consciousness called deliberation, which, when it finally issues in action, displays what we term *volition*.[6]

Our differentiation between subject and object rests, according to Spencer, on ten separate criteria. Subjective states (1) are relatively faint; (2) they are successors in time or copies of the objective; (3) they are changeable by volition in their qualities, (4) in their simultaneous order, and (5) in their successive order; (6) they form parts of a faint aggregate never known to be broken, which (7) is partially independent of the vivid aggregate, (8) with laws partly derived from the

[1] § 206. [2] §§ 310-13. [3] § 208.
[4] *Ibid.* [5] *Ibid.* [6] § 218.

other, partly peculiar to itself; (9) their antecedents are always traceable; and (10) they belong to a whole restricted to what we call memory.[1]

Objective states, on the other hand, are vivid, original, not changeable by volition, and form parts of a vivid aggregate with laws that originate within it. They have antecedents that may or may not be traceable, and they belong to a whole of unknown extent.[2]

The emotions, whether faint or vivid, belong to the faint aggregate, but they have the peculiar character of affecting the vivid aggregate by exciting muscular contraction.[3]

The faint aggregate, taken as a whole, is termed the *mind*. The body is a special part of the vivid aggregate which coheres with mind in various ways and is regarded, now as belonging to the vivid aggregate, now as belonging to the same whole with the faint aggregate. The rest of the vivid aggregate, which has no such coherence with the faint aggregate, is the *not-self*.[4] The idea of *power* is a result of the experience of resistance, which the vivid aggregate arouses,[5] and this experience of resistance is the primordial, the universal, the ever-present constituent of consciousness; it exists even in the lowest orders of creatures, and comes to be the general symbol for that independent existence implied by the vivid aggregate.[6]

The differentiation into subject and object is not complete until quite late in the scale of evolution. Even in low stages of human evolution self-consciousness is very incomplete; the child and the savage continue to speak of themselves objectively.[7]

### 5. *Spencer's Relation to Earlier Writers*

Comparing Spencer's analysis as a whole with that of the earlier British writers, we find that it proceeds accord-

[1] § 458. [2] *Ibid.* [3] §§ 460-1. [4] § 462.
[5] § 465. [6] § 466; *cf.* 347-8. [7] § 475p.

ing to the same associational method. The more complex states are traced back to simpler states, of which they are associative aggregates; the higher manifestations of mind are regarded as unions (associations and relations) of lower forms of manifestations, very much as Hartley and the Mills regarded them. The evolution factor brings in a certain change of interpretation of the process. Spencer regards the more fundamental unions as having taken place far back in the scale of organic life, resulting from the first in certain permanent changes in the physical organism; such physical modifications appear even prior to experience in individuals belonging to later generations, and consequently many complex mental states occur at the very dawn of individual experience.

Thus the meaning of *repetition of associations* is broadened, and the law of frequency or habit acquires a phylogenetic as well as an ontogenetic interpretation. The main problem remains substantially the same—to account for repeated successions and higher complexities according to the principle of association; but granting the validity of this principle, its application to the growth of the individual mind as actually observed becomes more plausible. It had been urged as an objection to the association theory that the comparatively few experiences of any individual are inadequate to account for the development of the space and time notions and of the rational functions without magnifying preposterously the permanent effects of each particular association. But granting evolution and the hereditary transmission of associative effects in organic structure, the law of repetition is no longer strained, and the process appears at least perfectly plausible.

An important effect of the evolution concept, as we have seen, is to correlate psychology more closely with biology. From this viewpoint Brown's ultra-psychological analysis of consciousness appears to omit factors which

would aid decidedly in explaining the process of association. For what persists phylogenetically is modification in the form of organic structure, not experiences themselves. Hence, to understand the growth of consciousness in the individual as well as the race, the psychologist must study more closely the development of nerve structure and the fundamental laws of nerve physiology. This side of the investigation is prominent in Spencer's work. He has quite as much to say concerning nervous function and types of motor activity as concerning states of consciousness; and that without in any wise identifying the two, or 'deducing' consciousness from neural or molecular changes.

In short, the transformation of the analysis brought about by the evolution view affects the details, the distribution of emphasis, and the terminology, without modifying any of the essential factors or laws of association. The principle of association remains an effective working-hypothesis; its psychological meaning is practically unaltered. The individual peculiarities of Spencer's analysis of the association process are quite distinct from his evolution standpoint.

The chief features of Spencer's psychology, so far as they concern us here, may be summed up as follows: (1) His theory of the *relativity of consciousness*. Consciousness appears only with *changes* in stimulation. This is an extension of the observed fact that a long-continued stimulation is less and less attended to.[1]

(2) His classification of the phenomena of consciousness (or mental life) into *feelings* and *relations of feelings*, and the identification of association with *revival*. Spencer, we have seen, regards the passage from one conscious state to another as a datum of mental life, though

[1] Like his hypothesis that "all motion is rhythmical" ('First Princ.,' Pt. II, ch. 10, § 82), it appears to be an induction extended far beyond observation.

not a feeling. This relation of feelings corresponds, in a way, to the relativity of consciousness regarded as a function of the stimulus. When the passage is from sensation to revived idea, that is, from a vivid experience to its faint copy, he terms it association, or revival. He thus distinguishes two sorts of union—*relation* and *revival.*

(3) Relations of feelings reduce to coexistence, sequence, and difference—or, in the final analysis, to relations of *difference* and *no-difference.* While in early experience coexistent states are more relational than successive, as the mind becomes more complex experience tends more and more to the *successive,* and less to the *coexistent* type of contiguity. Association or revival, whether of feelings or relations, proceeds by *similarity* or assimilation of the present to similar past experiences.

(4) Spencer mentions three laws of the *degree of associability*—vividness, repetition, and decreasing gain.

(5) Consciousness is classified into *feelings* and *cognitions,* the latter including states based on relations of feelings. Spencer's analysis of complex and higher conscious states is based (*a*) on certain differences in their elementary constituents (external and internal stimulation, revival) and (*b*) on the inheritance of the effects of association and relation. The motor element he regards as the physical concomitant of mind, not as an element or sort of consciousness.

(6) Spencer leaves entirely out of his discussion the problem of ' mental synthesis.' He does not reject it, but it seems to lie outside of his scope.[1] In the first place, he regards mental association and relation in their higher stages as phenomena of succession, which would obviate the problem. And second, his psychology, being part of a larger system of philosophy, is concerned mainly with quantity and quantitative relations, and only slightly with

[1] See ' Psychol.,' §§ 73-4, 55, 160.

differences of *sort*.[1] Spencer's ' unity of composition ' of mental phenomena [2] is an extension to the realm of mind of the primordial ' indefinite homogeneity ' which characterizes the cosmos. " Compound impressions," he says, " continually approach in their apparent characters to simple impressions; " their elements eventually become distinguishable from one another only by analysis.[3] Whether this mental analogue of physical ' integration ' has any qualitative meaning, he does not say. His statement of the process is much like James Mill's, but the notion of *integration* apparently has some real significance, and certainly does not tally with Mill's mechanical conception of mental composition.

### 6. *The Psychology of G. H. Lewes*

George Henry Lewes (1817-1878), a writer in many fields of literature, editor for some time of the *Fortnightly Review*, and domestic helpmate of the novelist Mary Ann Evans (' George Eliot '), is known in philosophy and psychology by his ' Biographical History of Philosophy ' (1854-6),[4] his ' Physiology of Common Life ' (1859-60), and a series of volumes entitled ' Problems of Life and Mind ' (1874-9).[5] This last work develops

[1] When I see a red rose, I have a peculiar qualitative experience of ' redness.' Spencer seems to regard this qualitative phenomenon as peculiar to subjective psychology,—an interesting fact, but of no more scientific value than the dot over an *i* in the statement of one of Newton's laws.

[2] § 380.

[3] § 169.

[4] Revised editions to 1880.

[5] The first series of the *Problems*, Vols. I and II, with subtitle ' Foundations of a Creed,' includes Introduction, Psychological Principles (Psy. Pr.), and six Problems. The second series, Vol. III, entitled ' The Physical Basis of Mind,' with the serial title subordinate, contains four Problems (1-4). The third series (posthumous), embracing Vols. IV and V, takes the serial title again, and contains four Problems; the subtitle of Vol. IV is ' The Study of Psychology,' from the problem discussed—Vol. V has no subtitle. In citing this work the *volume* (from I to V), *problem*,

in detail his views of the nature of mind and his system of psychology. The final volume was never revised by the author; it is not arranged in proper sequence and contains many redundancies. But it is quite readable and complete with the exception of the last Problem; this was written shortly before the author's death and is merely a sketch.

Lewes is an acute and logical thinker, and his 'Problems' carry the associational analysis to its historical culmination. One could only wish that he had written a briefer statement of his position in one or two volumes, taking up the analysis in a single, orderly sequence with less discussion and fewer illustrative examples. The inner consistency and force of his system would then have appeared to better advantage, and Lewes would probably have exerted a greater influence on the development of psychology in England.[1] The fact remains that Lewes's system has not been noticed to the extent of Bain's or Spencer's, although it seems to deserve greater attention on the part of psychologists on account of its striking adaptation of the traditional English position to the new results of biological research and to the evolution theory.

Besides several notable advances in the manner of performing the mental analysis and some improvements in nomenclature, Lewes makes two original contributions to the analysis itself. In the first place, he lays special emphasis upon the *social* side as a factor in mental evolution; and second, in place of the usual distinction between sensations and ideas, he adopts a threefold division into sensations (or feelings), images, and ideas (or

and *section* are given. Section numbers run through each 'problem' separately.

[1] Lewes would probably have been more carefully studied, in spite of his prolixity, had not the general trend of psychology during the next decades been away from associationism. See Chapter VIII.

conceptions), attributing a special symbolic character to the third.

(1) Lewes's conception of the special importance of social phenomena for mental science is traceable to Auguste Comte. But in opposition to Comte he insists that we must treat psychology as an independent science. The data of psychology, he affirms, are contributed by biology and sociology. The biological data furnish the starting-point of both animal and human psychology. The sociological data appear only in the human sphere and form the basis of the human intellectual and moral life, as distinguished from the animal sentient life.[1] Such diverse phenomena as folk-customs, traditions, arts, tools, science-lore, literature, depend on the system of intellectual signs known as *language;* and language exists only as a social function.[2]

(2) The primary form of sensibility, which Lewes calls *feeling*,[3] includes sensibility resulting from external stimulation (*special sensations,* the 'sensations' of earlier psychologists), and sensibility due to systemic stimulation (systemic sensations or *emotion*). A reproduced feeling constitutes an *image*. But when the image has lost its original value and has become merely a sign or symbol of some feeling different from itself, it then becomes an idea or conception.[4] This triple division he also borrows from Comte,[5] though the third element is found implicitly in most of the associationists.[6] The manner in which the image is transformed into the idea and the role of ideas

[1] 'Probs.,' Vol. I, Psy. Pr., § 1.
[2] *Ibid.*, § 10.
[3] V, Prob. 2, §§ 3-5.
[4] I, Psy. Pr., §§ 44, 64-5, 25; V, Prob. 4, §§ 26-8; V, Prob. 2, § 7.
[5] V, Prob. 3, note following § 14.
[6] It is to be regretted that Lewes did not work out more fully and consecutively his distinction between *image* and *idea*. He emphasizes the striking difference in their associative value ('logic'), but his discussion of the *nature* of symbolic experience is scattered about in various parts of his work.

in psychological evolution will be examined presently. The important point here is that Lewes regards ideas or conceptions as essentially a social product and instrument; they are *signs,* whose objective expression is *language.*

While Lewes agrees with Spencer in laying special stress on physiology and biological evolution as a basis of explanation for psychological phenomena, he does not go to Spencer's length of regarding the biological standpoint as furnishing the only scientific element in psychology. He endeavors to maintain an equilibrium between the objective and subjective sides of the science, and puts forth an earnest plea for introspection as an instrument of research.[1] He claims that what the data of introspection lack in quantitative *exactness* they make up for in possessing the highest degree of *certainty;* the results of external observation or objective analysis, on the other hand, though preeminently exact, lack this element of surety or conviction.[2]

### 7. *Association and Logical Grouping*

Lewes starts with sensibility, which he uses as a general term for the material of psychology. The psychical organism evolves from 'psychoplasm,' or 'sentient material.' The psychoplasm is ever fluctuating; it is constantly being renewed, and these movements constitute the function of sensibility.[3] Sensibility is the internal factor, to which corresponds, on the physiological side, "the successions of neural tremors variously combining into neural groups"; [4] it includes both consciousness and subconsciousness.[5]

There are three fundamental laws of sensibility: (1)

[1] IV, Prob. 1, §§ 50-1, 62-6. [2] *Ibid.*
[3] I, Psy. Pr., § 6; *cf.* III, Prob. 1, § 60.
[4] I, Psy. Pr., § 6; *cf.* V, Prob. 2, § 33.
[5] I, Psy. Pr., § 33; *cf.* III, Prob. 3, §§ 50-2.

*Interest:* "We see only what interests us, know only what is sufficiently like former experiences to become, so to speak, incorporated with them—assimilated by them." [1]

(2) *Signature:* Every feeling "has its particular signature or mark in consciousness, in consequence of which it acquires its objective localization, i.e., its place in the organism or in the cosmos." [2] Signature is Lewes's term for the individuality or specific identity of each particular sensation or experience.

(3) *Experience, or registration of feeling:* "Through their registered modifications, feelings once produced are capable of reproduction, and must always be reproduced, more or less completely, whenever the new excitation is discharged along the old channels." [3]

Sensibility becomes organized into definite mental states along with the evolution of the physical organism, and in modes best described by reference to the corresponding biological processes. In physiological reaction we find a threefold process—stimulation, coordination, and discharge; the psychological equivalents of these are *sensible affection, logical grouping,* and *impulse.*[4] The sensible affection includes, as we have seen, sensibility resulting from both external and systemic stimulation.[5] But "no reaction on a stimulation can be called forth without revival of residua of past stimulations." [6] These revival states or images arise according to two fundamental processes, irradiation and restriction, whose laws may be stated on the physiological side as follows: (1) *Irradiation.*—Every wave impulse is irradiated and propagated throughout the system. (2) *Restriction.*—

[1] Psy. Pr., § 9; *cf.* V, Prob. 2, §§ 74-6.
[2] I, *loc. cit.; cf.* V, Prob. 3, §§ 117-8.
[3] I, *loc. cit.; cf.* V, Prob. 2, ch. 4.
[4] V, Prob. 2, § 33.
[5] I, Psy. Pr., § 28.
[6] V, Prob. 2, § 35.

Every impulse is restricted, and by its restriction a group is formed.[1]

Revival states, or reinstatements, are due physiologically to the irradiative tendency, by which any given neural process tends to re-excite those processes which formerly were excited in conjunction with it, or which are anatomically linked with it.[2] On the subjective side this means that a sensation formerly connected with the given sensation may be reproduced with fainter energy as an image.[3] Physiologically, the irradiative tendency is limited by the definite pathways of discharge cut by previous stimulations—the law of restriction; [4] on the psychological side this means that the given sensations will tend to re-excite certain groups of fainter feelings of previous impressions, so that they are grouped into a judgment or perception.[5]

Irradiation and restriction work together in the process of *Reinstatement,* whose law is as follows: "Every mental state will be reinstated whenever the conditions of its production are reproduced; and the reinstatement will be more or less complete according to the more or less perfect reproduction of the original conditions." [6] The directly excited feeling (*sensation* or *presentation*) is distinguished by its greater vividness from the indirectly excited or reproduced feeling (*image* or *representation*). The former is fitly considered *real,* because it has objective reality (*res*) for its antecedent stimulus; the latter is *ideal,* because its antecedent is a subjective state.[7]

Association, according to Lewes, is a special form of the process of Reinstatement. Reinstatement is grouping; association is "the grouping of groups which are not connected by any necessary anatomical links. Processes which depend on the native mechanism, although dependent on the connection of groups, are not called asso-

[1] *Ibid.,* § 36. [2] I, Psy. Pr., § 37. [3] § 42. [4] § 35.
[5] I, Psy. Pr., § 38. [6] V, Prob. 2, § 80. [7] I, Psy. Pr., § 43.

ciative processes. Association is acquisition." [1] Without discussing the laws of this restricted type of association at all systematically, Lewes refers his readers to Bain's exhaustive analysis, which he accepts in the main. He notes, however, two phenomena of association which Bain fails to take properly into account: (1) "The enormous influence of the emotional factor . . . in determining the reinstatement of images and ideas." (2) "The influence of obscure organic motors, manifested in the sudden irruption of incongruous states—the orderly course of association being burst in upon by images and ideas having none of the normal associative links." [2]

It is not clear why Lewes restricts the meaning of the term *association* to such narrow limits. He goes even further than Spencer in this respect. Spencer limits the term to revival by similarity. Lewes makes it a sort of adventitious revival; he harks back to Locke's notion of a connection "wholly owing to chance or custom." His broad treatment of the process, however, fully warrants us in considering Lewes an associationist, in spite of his peculiar restriction of the term. Historically, *association* corresponds closely to what Lewes calls *grouping*, or *logical process*. And this logic, or grouping of elements, enters fundamentally into his system, as we shall see; it begins at the lowest and simplest states and follows through to the highest and most complex.

The grouping or coordination of experience can be understood only when interpreted as part of the entire reactive process, whose three terms on the psychological side are *affection*, *grouping*, and *impulse*. The grouping process is of significance only as it leads to some new or more integrated form of impulse and activity. And just as grouping determines impulse, so it is determined

[1] V, Prob. 2, § 94. In this passage Lewes accepts Spencer's conception of 'association,' not the wider connotation of earlier writers.
[2] *Ibid.*, § 95.

by affective data. The modifications of neural structure caused by past impressions are what determine the specific neural grouping; on the subjective side it is the residua of former experiences that determine the specific mode of grouping in any instance.

Grouping, then, depends not only on the stimulus at the present moment, but also on the entire condition of the organism as determined by its past history—in other words, it depends on the *self*, as determined by the individual's whole past experience, as truly as on the given presentation.[1] "When once a neural group, however complex, has been formed, it operates like a simple unit, and enters as such into the combination of other groups." So, on the subjective side, sensations which were orginally independent are "brought into such convergence by intermediate links that they now coalesce and act together without the need of such intermediation"; for example, visual and tactile sensations combine to form "an intuition of form and size of an object; but these having coalesced, and the intuition being effected, we no longer need the intermediate process."[2] This is the simultaneous aspect of grouping.

The serial aspect is more important. In accordance with the law of irradiation, "one excitation of the sensorium sets going associated excitations, the associations rising out of prior modifications."[3] This results in a *series* of images and ideas, whose specific course is determined according to the law of restriction. Restriction operates in accordance with two distinct factors: the specific revival depends (1) on the harmony of the image to be revived with the ground-tone of feeling or mental predisposition at the time, and (2) on the energy of the image.[4] This grouping of experiences in serial order is

[1] I, Psy. Pr., § 9—law of exp.; V, Pr. 2, §§ 42, 77, 166-72.
[2] V, Prob. 2, § 136.
[3] V, Prob. 2, § 42.
[4] *Ibid.*, 102.

what Lewes terms the *logical process,* or in brief, *logic.* As a psychological process, logic is "not simply the process of reasoning, but that which is common to reasoning and to all other modes of combination belonging to mental states. This common process is *coordination,* or grouping of neural elements." [1] One mental state thus determines its successor, and is included in it.[2]

All experience, even its lowest forms, involves coordination. On the physiological side, this process of coordination results from the tendency of stimuli to general irradiation and restriction of such irradiation by previous modifications of structure to more or less habitual paths. On the mental side, therefore, the experience grouped with the given experience would be one that had been *contiguous* to it in some past primary experience. And since the associated element is always a revival—a reinstatement, not a mere *copy* [3]—only the law of contiguity would seem to apply; in other words, the law of similarity would appear to have no place in association. Lewes is apparently mistaken in believing that he agrees with Bain in this part of his analysis, since the latter admits both contiguity and similarity as associative principles. He differs with Bain still further in assuming an association by contrast.[4] It should be noticed, however, that Lewes admits these principles only as laws of 'casual' association, not of the general logical process.[5]

While he does not expressly admit that the synthetic process yields anything really new in chemistry or in

[1] V, Prob. 3, § 2. Lewes uses the term *neural element* here and frequently elsewhere to denote the primitive, unanalyzable element of *experience.*

[2] *Ibid.*

[3] V, Prob. 4, § 8.

[4] V, Prob. 2, §§ 100-1.

[5] Possibly Lewes would have reduced these "groupings of groups which are not connected by any necessary anatomical links" to irradiation and restriction also, and attributed all association to contiguity, had he repeated for himself Bain's analysis.

mental grouping,[1] several passages show that Lewes recognizes a qualitative variation; he concedes that the effect of mental synthesis is, in appearance at least, similar to what chemical synthesis appears to be. Causation, he says, is of two sorts: the effect may be " the *resultant* of its components, the product of its factors "; or, in cases of cooperation of things of unlike kinds, the effect is an *emergent,* that is, it is ' qualitatively unlike ' the causes.[2] Quality is a primary fact of feeling which enters into every subjective synthesis; [3] and no matter how much we strive to reduce psychology to quantitative terms, " no variation of undulations will really correspond with variation in color, unless we reintroduce the suppressed *quality* which runs through all color." [4]

### *8. Lewes's Analysis of Mental Phenomena*

Lewes attributes not only the higher types of experience, but *all* definite experience, including sensation itself, to the grouping or logical process. " A sensation is a group of neural tremors." [5] Given the hypothetical simple element underlying experience, which he calls a neural tremor, such tremors are grouped into definite sensations by the irradiative tendency which unites to them the residua of past tremors.[6] A perception is " the synthesis of all the sensations we have had of the object in relation to our several senses "; [7] this includes secondary elements (images) as well as primary (sensations).

The application of the grouping principle to space perception is typical: extension is perceived as a continuum, he says, inasmuch as by irradiation " there is a necessary

[1] See I, Psy. Pr., § 88.
[2] II, Prob. 5, §§ 65-6.
[3] II, Prob. 2, § 31.
[4] III, Prob. 3, § 5.
[5] V, Prob. 2, § 35; *cf.* I, Psy. Pr., § 24.
[6] As already noted, the term *neural tremor* is used subjectively.
[7] I, Psy. Pr., § 25.

blending of the discrete points, a fusion of the similar tremors." [1] And the observed temporal unity of consciousness admits of explanation in the same way, the serial order of conscious experiences being the result of serial irradiation.[2]

A remembered sensation is something more than a repetition of the sensation: the repetition of the stimulus causes in addition a stimulation of residua, which furnish 'an escort of other states.' [3] Memory differs from perception in the character of this escort: in memory the escort is of states constituting the field of personal experience, in perception the escort lacks that definite personal character.[4] Memory is a grouping of image elements as they occurred in the past. Imagination differs from memory in that its personal escort has reference to the present or future, not to the past.[5] In plastic or constructive imagination the image elements are grouped in new ways.[6] "Images, although reproductions of perceptions, possess a property not possessed by perceptions, namely, that of *facultative reproduction,* which enables them to be abstracted from the sensible order of presentation, and combined and recombined anew." [7] Emotions are to be regarded under two aspects—as sensations and as impulses which guide action; under the former aspect "they belong to the systemic more than to the special affections, but are complexes of both." [8]

All the above-named forms of grouping belong to the *logic of feeling,* or to its subdivision, the *logic of images.* The grouping of ideas, or symbols, or conceptions, constitutes the *logic of signs.*[9] In the mode of grouping known as logic of images, the image becomes the representative

[1] Psy. Pr., § 35.
[2] *Ibid.,* § 36.
[3] V, Prob. 2, § 82. This 'escort' corresponds to what William James later called the "fringe of consciousness."
[4] *Ibid.,* § 87.
[5] § 92.
[6] § 93.
[7] I, Psy. Pr., § 64.
[8] V, Prob. 3, § 154.
[9] I, Psy. Pr., § 25.

of its sensation; it is a sort of substitute, but a substitute which is more or less *equivalent* to the thing signified.[1]

With the growth of organization "these images may be replaced by signs which have no trace of the sensations signified"; [2] they are substitutes of sensations, not reinstatements.[3] This higher type of reproductive states Lewes calls *ideas,* as distinguished from *images.*[4] Words are signs of this sort; the auditory symbol *horse* has no likeness to the visual or other sensations which the idea symbolizes—it may not even awaken a visual image of the horse; yet such verbal symbols "operate quite as effectually as the images." [5] Verbal symbols (language) arise as a result of social intercourse—they could not have arisen without it.[6] For this reason and also because a high degree of nervous organization is requisite for the production of words, language belongs solely to the human species.[7]

Ideas, with all their substitutive and symbolic value, could never have developed *ab initio* in an individual's single lifetime. But according to the evolution theory they are not innate in the older sense—rather, they are con-nate.[8] The advent of language introduces a new factor into the environment—namely, the social medium.[9] In the higher stages of mind, where ideas exist, we find a social as well as a physical environment, an ideational as well as affective self.[10]

Ideas group themselves according to the same principles as images. Serial groupings of ideas constitute *thought,* or the logic of signs. Since ideas are general

[1] *Ibid.;* V, Prob. 2, § 137; Prob. 4, § 28.
[2] V, Prob. 2, § 137.
[3] V, Prob. 4, § 26.
[4] *Ibid.* This gives still another meaning to the much-defined term *idea.* It would seem more in keeping with historic usage to make *idea* the generic term, including *imagery* and *thought* as its species; thought would be the *symbolic type of ideation.*
[5] V, Prob. 2, § 137.
[6] I, Psy. Pr., §§ 10, 54, 63; V, Prob. 4, ch. 6.
[7] *Ibid.*
[8] I, Psy. Pr., §§ 57, 60; *cf.* § 8.
[9] *Ibid.,* §§ 10, 57.
[10] V, Prob. 2, §§ 168, 171-2.

and flexible, while images and perceptions are always particular and fixed,[1] we are able in thought to pass rapidly and easily from one term to another, in a way that would be impossible were it necessary to translate each idea into a specific image.[2] It is this use of the general symbol that constitutes the superiority of the human over the animal mind.[3] The logic of signs enables man to act with reference to more distant ends, as the symbols become further removed from direct correspondence to sensations; [4] whereas, the 'reasoning' of animals is always in terms of sensations and images.[5] 'Associations' in the narrower sense are generally symbolic, whence the phrase *association of ideas*.[6]

The developed processes of thought form the *intellect*, or rational functions, or reflection.[7] All these processes —judgment, induction, deduction—are reducible to the 'logic of signs'; [8] they culminate in the *laws of thought*, which Lewes focuses into a single *principle of equivalence* [9]—an affirmative counterpart of the criterion of certitude which Spencer states in negative form as the inconceivability of the contrary.

The consciousness of volition includes two factors according to Lewes: (1) the feeling of effort in attention, which is reducible to muscle sensations; [10] (2) an innervation feeling, due to the irradiation of the outgoing motor impulse *back toward the center*.[11] But the consciousness attending volition is merely an incidental feeling linked

[1] I, Psy. Pr., § 25; V, Prob. 4, § 27. [2] V, Prob. 4, § 61; *cf.* chs. 5, 6.
[3] *Ibid.*, §§ 45-8. [4] I, Psy. Pr., § 27.
[5] V, Prob. 4, §§ 40-4. [6] V, Prob. 2, § 94.
[7] In several passages Lewes makes *discrimination* the fundamental fact of intellect; he appears to use the term to denote the selective or restrictive effect of grouping. Though he does not explicitly say so, he apparently applies the term *discrimination* to the subjective aspect of 'restriction' and *selection* to its objective or neural aspect. (See I, Psy. Pr., § 17; III, Prob. 4, §§ 51, 53; V, Prob. I, §§ 104, 151.)
[8] II, Prob. 2, chs. 2-4. [9] II, Prob. 2, chs. 4, 5.
[10] V, Prob. 2, § 157. [11] V, Prob. 3, §§ 82-91, esp. 87.

with it;—the motor side of subjective phenomena is impulse or action, rather than feeling. The grouping or coordinating process is the guide which controls the impulse, and thereby regulates conduct. In the broadest view of psychology "the significance of mental phenomena is their relation to conduct." [1]

### 9. *Lewes's Contributions to the Problem*

The main features of Lewes's psychology, in so far as they bear on the association problem, may be summed up as follows: (1) He takes the concept of biological evolution from Darwin and Spencer, and carries it out on the psychological side more fully than they.

(2) He interprets the laws of nervous irradiation and restriction in mental terms, under the single law of *Reinstatement,* which serves to account at once for (*a*) the distinction between primary and secondary feeling, or sensation and image, and for (*b*) the grouping or associative function of mental phenomena, which he terms *logic.*

(3) The *grouping tendency* accounts for all complex forms of experience, from sensation upwards, the only datum not attributable to grouping being the hypothetical underlying element, the neural tremor.

(4) The tendency to use part of a complex experience as a sign for the whole, which is a general phenomenon of mental activity, evolves to a higher form in the *human* mind. In man arbitrary associated elements (ideas) come to be used as symbolic signs for sensations and images which they in no wise resemble. This *symbolism* and *logic of signs* arises out of social intercourse, for which words and language afford a convenient, flexible, and adequate medium.

(5) Images are individual, concrete, specific—ideas are

[1] *Ibid.,* § 15.

general, abstract. The sequence of ideas, or logic of signs, is therefore more facile and more adaptable than the logic of feeling or the logic of images. Ideas and ideational processes constitute the intellectual side of the mental life, and *intellect* is its highest form.

(6) An established group, which has become a single experience (intuition), is characterized by a higher degree of *belief,* conviction, certainty, than a group in the making (inference); intuitions of sensations and images (called perceptions) are distinguished from intuitions of ideas (conceptions); and inferences of sensations and images (memories, hallucinations, imaginations) are distinguished from inferences of ideas (judgment, reasoning).

(7) Lewes applies the term association in an unusual way to that special sort of grouping in which the elements are casually brought together by contiguity, similarity, or interest. Grouping in general, which he calls logic, proceeds by the revival of identical elements in the form of images, the revival operating from one element to another according to the principle of contiguity only. He applies Bain's treatment of association in general to his own 'casual associations.'

To appreciate the breadth of Lewes's viewpoint we should also note several other points which bear on our problem only slightly. (1) His conception of the cooperation of organism and environment in experience. The present stimulus and the self due to one's entire past experience work together; any given experience is a resultant of these two factors. (2) His extension of the nervous arc concept to psychology. Feeling or affection, logic or grouping, impulse or action, are the mental equivalents of the three sides of the nervous arc; they form the psychological spectrum, whose combination constitutes mentality. (3) His endeavor to give proper weight to both the subjective and objective sides of psy-

chology—to the method and data of introspection as well as to the method and data of external observation. (4) His demarcation between external sensations and the systemic sensations. This distinction deserves special notice on account of the prominent role which he assigns to the latter.

To grasp Lewes's system as a whole requires considerable effort. His style is prolix and his development is not always systematic. He is careless of detail, inconsistent on some points, and obscure in his treatment of others. Yet upon close examination he proves to be the most consistently *associational* of all psychologists. Lewes deserves far more study than has been accorded him by recent writers; and especially does he deserve the attention of genetic psychologists. Those who wish to know at first hand the *evolutionary* associationism at its best, should read his final volume.[1] Though not a complete exposition, it contains most of the essential points of his psychology, and corrects many of his earlier inconsistencies.

### *10. Other XIXth Century Associationists*

Among the many writers whose psychology shows the influence of Spencer and Lewes, the following may be cited as most closely related to the association movement.

Joseph John Murphy (1827-1894), though a believer in innate intelligence, lays stress on association, which he holds to be a racial growth. In his 'Habit and Intelligence' (1869) he declares that association enters into every mental process except the most elementary; [2] "a complete treatise on the laws of association would be nothing less than a complete treatise on psychology." [3] The laws of association, however, while they would ac-

[1] 'Problems of Life and Mind,' Vol. V.
[2] Vol. II, p. 54.
[3] Vol. I, p. 55.

count for the origin of thought, would not account for our belief that a thought corresponds to an external reality.[1] This and other complex phenomena of consciousness depend on a principle of organizing intelligence.[2]

W. K. Clifford (1845-1879), in his 'Lectures and Essays,' devotes an essay to 'Some of the Conditions of Mental Development,' in which he maintains that "the first indication of consciousness is a perception of differences."[3] The essay on 'Body and Mind,' which is based on the hypothesis of parallelism, and his volume on 'Seeing and Thinking' (1879) also show the influence of the association psychology.

The contributions of Francis Galton (1822-1911), whose numerous studies on mental heredity are based on the standpoint of Spencer and Lewes, will be discussed in connection with the recent experimental work on association.[4]

[1] P. 152. [2] P. 54. [3] Vol. I, p. 97 [4] Chapter VIII.

# CHAPTER IV

## SUMMARY OF ENGLISH ASSOCIATIONISM

### *1. Development of the Association Concept from Hobbes to Hume*

The analysis of mental processes which the English school carried out is a logical result of their philosophical attitude. These writers employed the empirical method in philosophy. They were concerned in demonstrating that all knowledge is derived from experience—that it occurs without the mediation of innate ideas which were supposed by their opponents to exist in the mind prior to experience. To establish their contention it was necessary to analyze the character of experience and show that knowledge can be accounted for in terms of empirical data alone. Assuming that impressions due to external stimuli give rise to sensations of a definite character, how do these sensations become organized into knowledge?

What struck these writers most forcibly at the outset of their psychological analysis was the observed fact that one experience succeeds another with a certain degree of regularity. In such sequences, moreover, the prior experience does not vanish entirely before the succeeding one begins to appear; there is a union of some sort between the two members of the sequence. This *fact of union,* according to the associationists, constitutes the basis of organized experience and knowledge. They applied the term *association* to the process.

The aim of the English school was to account for all the facts of conscious life, excepting the crude material (sensation), as the product of the operation of association.

Thus their chief problem was to analyze the complex data of consciousness into elementary experiences, and to show how these elements are combined together by means of the associative factor. In connection with this analysis of experience they endeavored to formulate the laws of the associative process itself. A chronological study of the movement indicates how the analysis grew clearer with each writer, and how at each step the association process gained in importance. At first a mere incident in the sensationist theory, it at length became the sole means of explaining all the great variety of experience that lies beyond sensation.

Hobbes represents the crude sensation psychology. He adopts sensation as the basis of all experience. Every other mental process is derived from it. Imagination and memory, in particular, are regarded as 'decadent' sensations. The order of succession among representative experiences follows the order of the original sensations, but inasmuch as a sensation may have been followed sometimes by one sensation, sometimes by another, the order of representative experience is not always unequivocal. The sequence, he says, may be unguided or inconstant, or it may be regulated by desire. Beyond recognizing that habit is an important determining factor he attempts no real analysis of association. Thus when he passes to the higher intellectual processes or experiences he has no weapon of attack against the nativists; their assumption of innate ideas seems quite as acceptable to introspection as his assumption that abstract ideas are decadent sensations. In many cases ideas appear to bear no resemblance to sensations, and their derivation from that source may well be challenged.

Hobbes's theory may be as plausible as Descartes's or even more so, but it provides no means for refuting the theory of innate ideas. Yet in spite of its inadequacy, Hobbes's analysis accomplished one important result. It

set the pattern for an empirical conception of mind, and following the lines which he marked out the role of association came naturally into greater and greater prominence.

Locke sought to meet the difficulty of accounting for the higher intellectual processes by emphasizing *reflection* and treating it as coordinate with sensation in the formation of experience. We have two sources of experience: the outer and the inner—sensation and reflection. Now the strength of the nativist position lies in the difficulty of deriving certain of our higher experiences from bare sensation, and when Locke supplements sensation with reflection he suggests an answer to the nativist objection. His own position is not strictly empirical, for in place of innate ideas he merely substitutes a native faculty or power—*reflection.* And this involves a concession to nativism which Hume held to be needless. But Locke's explanation of complex experiences opens the way to an empirical solution through the associative process. He is thus really responsible for the transition from sensationism to associationism. One is hampered in the attempt to determine Locke's attitude by the vagueness of his conception of reflection. Yet this very vagueness is of the utmost importance historically, for it drew attention to the weakness of this portion of Locke's psychology, and led to the extension of the association principle to account for complex and derivative ideas, which Locke attributed to reflection.

It is remarkable that historians have generally overestimated Locke's contribution to successive association, and at the same time have ignored his stress on the union of simultaneous experiences. For reflection, in one of its aspects, is the means of combining a number of simple experiences into a single compound experience. Simultaneous association, which Locke attributes to the faculty of reflection, is therefore an essential factor in his scheme

of mental analysis. On the other hand, he regards successive association as a hindrance to right thinking, a habit to be uprooted by careful exercise in the 'voluntary' supervision of our trains of thought.

BERKELEY's analysis is very incomplete, but his theory of space perception furnished empirical psychology with a valuable asset. In demonstrating that distance or depth is not a sensation but an element added to the visual data, he indicated how psychological analysis might break up apparently simple experiences into more primitive data. If perception itself is an associative union of elements, why not imagination and thought? This implied query was taken up by later writers, who applied the principle of association to account for the welding together of elements into the higher intellectual experiences.

HUME sought to clarify Locke's analysis by abandoning reflection as a separate source of experience. He admits only two varieties of experience, sensation and ideation (to use our present terms); and of these, ideation is merely a faint replica of sensation. But he recognizes the need of accounting for those ideas and images which differ so widely from sensation that they cannot be directly traced to that source. To explain their existence he relies on association, which he submits to a more careful analysis than any of his predecessors, with results not far from those of Aristotle.

Hume's chief interest is to explain the succession of ideas, rather than to account for their complexity and transformations. He attributes the causal connection of logical thinking to habitual association, but his treatment of simultaneous association is limited to a few suggestions.

### 2. *Contributions of Hartley and Brown*

With HARTLEY the association psychology first assumes a definite form. He gathered together the hints

which were scattered through the writings of his predecessors, and wove them into a sightly fabric. His power of analysis carried him to the root of the problem. As a physician he saw the need of relating psychology to physiology. And his scientific training impelled him to reduce the mental side to the simplest and fewest terms possible.

Hartley starts with a dualism of matter and mind. Stimulation of the sense organs results in brain vibrations which are accompanied by sensations, though not to be regarded as physical causes of the latter.[1] Ideas are attributed to fainter vibrations of the brain substance which occur when the vestiges of former vibrations are stimulated. The mental side, then, is reduced to two terms, sensations and ideas, which in the last analysis are data of the same type, characterized by a stronger and fainter degree of intensity respectively. They are correlated with activities of the physical organism.

But if sensations are traceable to external stimulation, what is the nature of the physical activity lying at the basis of *ideas?* Investigation shows that it is not external—that it originates within the brain itself. In the first instance it is a sensory brain impulse which excites to a fainter degree the traces of previous sensory impulses. Following this, an ideational impulse may also stimulate other traces and thereby give rise to other ideational impulses. Thus the physical basis of an idea is either a sensory brain state or an ideational brain state.

Regarded from the mental side, this passage from sensation to idea or from one idea to another is the process of association. A sensation or an idea (or, Hartley adds,

[1] Since he expressly rejects any causal connection, this is distinctly a theory of psychophysical parallelism. (It would be interesting, by the way, to know how far Hartley's theory of brain vibrations is responsible for the modern pseudo-scientific talk of sympathetic mental vibrations!)

a muscular movement) is able to induce another idea or another muscular movement, provided the latter term of the sequence has in the past occurred frequently in conjunction with the former term. The meaning of the law is understood when we examine the physiological side of the process. If several sensory brain processes have occurred many times in conjunction, then the recurrence of one induces a fainter repetition of the others, and these faint stimulations may in turn lead to faint repetitions of other sensory processes which have formerly occurred in conjunction with them. Thus Hartley's law of association is really the statement in psychological terms of a fundamental physiological process.

There is no very marked distinction in Hartley's theory between successive and simultaneous association. Experiences which have occurred simultaneously as sensations may be associated successively as ideas. And we may credit him with holding the converse also—namely, that when sensations have occurred frequently in immediate succession, their ideal counterparts may be simultaneously associated in the form of a compound idea.[1] Each of the two modes yields an important datum. Succession explains the rise of ideas (or images, as we should call them); and simultaneous association explains their complexity and deviation from the original sensations.

It is fully in keeping with Hartley's physiological trend that he does not regard resemblance as a factor in association. The physiological basis of the idea is the *same* brain process as that which formerly accompanied the sensation, only fainter. Hence, a stimulus induces by association not similar processes, but a renewal of either the same processes or contiguous ones. Contiguity is the sole criterion of what alternatives are open to association, while frequency or habit measures the strength of the

[1] He does not explicitly state whether the original association of sensations is serial or simultaneous.

associative tendency in given instances and determines the result as between these alternatives.

We should notice that Hartley indicates two fruitful directions in which the analysis of experience may be carried out by the use of association, though he does not himself proceed very far with either. These are (1) the *motor* aspect of consciousness, including volition. He indicates the relation of voluntary muscular movements to sensation and ideas in his general formulation of the associative law. (2) The derivation of *thought* and *reasoning* from imagery proper. The transition from imagery to abstract thought is approached from several sides: in his account of the origin of complex ideas, in his study of verbal association, and in his analysis of belief. The weakness of some parts of his analysis and its incompleteness in dealing with the more complex experiences was in itself a stimulus to further study. In particular, the vagueness of his explanation of belief incited his successors to a minute analysis of its nature.

There seems abundant reason for according Hartley the title of founder of the association school, since he was the first to adopt the associative principle as the fundamental operation of psychology. The consistency and deep-reaching character of his investigation certainly entitles him to be regarded as the typical representative of the earlier period of associationism, when the principle itself was new and required elaboration before it could be effectively applied to the more intricate phenomena of mental life.

The effect of Hartley's constructive work appeared first in other sciences. The principle of association was seized upon by students of ethics, esthetics, logic, jurisprudence, and biology, and applied to their several spheres. Associationism appeared to be ' in the air ' during this period, much as evolutionism was in the air a century later. It would be difficult to determine how far Hartley was re-

sponsible for this radiation of the movement and how far it is due to the combined influence of the whole body of empirical thinkers from Hobbes onward.[1] The contemporaries and successors of Hartley must have derived their well-rounded notion of association mainly from him, since most of them assume it without independent analysis, and their broad treatment is not to be found in the earlier authorities. Yet it would not be fair to ignore two other tendencies of the time, for which Hobbes and Hume are responsible respectively.

The social contract theory, which held sway in the latter part of the eighteenth century, and was undoubtedly suggested by Hobbes's conception of the state, led to views regarding society which were quite favorable to the association psychology. The two theories are indeed quite independent and belong to entirely different spheres of thought. But their world-view is similar. Each is a mechanistic notion, opposed on the one hand to supernaturalism and belief in irreducible complexes, on the other hand to racial evolution. According to the social contract view, society is not an unanalyzable, divinely ordained composition; neither is it a growth by means

[1] Writers of the 18th century were not careful to cite their authorities. It is not difficult to discover the sources which influenced them when the suggestions led to polemic; they are frank enough in naming their antagonists. But they do not usually deem it necessary to mention the sources whence their own standpoint was derived. In the present instance the search would lead us too far into problems of textual analysis. The writer believes, however, that present-day psychologists give too little weight to Hartley's influence on his contemporaries, just as they attribute too little importance to his original contributions to association.

Psychologists have had to rely largely on histories written by philosophers for their estimates of the association movement. The importance of Locke, Berkeley, and Hume bulks large in philosophy, while Hartley is a 'mere psychologist.' The present volume seeks to correct the misplacement of emphasis in this particular instance. It is desirable that *all* historical questions which concern psychology be re-examined from a psychological standpoint and that a history of *psychology* be written which shall counteract the errors into which our histories of philosophy have undoubtedly fallen in tracing the development of these problems.

of internal forces. It is an artificial union of human elements. And according to the earlier association theory human experience also is not an unanalyzable supernatural product nor a real development and transformation. The association of experiences is rather a mechanical reconstruction of elements into somewhat more intricate and complicated forms. Thus the two theories harmonized with each other and together constituted a tendency of thought during this period.

Again, the Kantian philosophy, which is traceable to a reaction from the conclusions of Hume's philosophy, drew attention to various aspects of Hume's analysis and brought association into prominence. Kant's disciples in Britain were strenuously endeavoring to advance beyond Hume's empirical view of mental phenomena. But the very strife itself served to familiarize the general reader with the notion which was popularly called the 'association of ideas.'

From philosophy and jurisprudence, then, as well as psychology, came influences which turned British thinkers in the direction of associationism. The work of such writers as Tucker, Priestley, Alison, and Erasmus Darwin in applying the association doctrine to special sciences has been noticed in an earlier chapter.

Thomas Brown's position is peculiar, since he rejects the connection between psychology and physiology, which lies at the basis of Hartley's system. Moreover, his application of the association doctrine to intuitional psychology is unusual. The Scottish school in general seek to distinguish each separate mental faculty carefully from every other, while the associationists endeavor to unite all mental phenomena into one class. Brown is an introspectionist, but he nevertheless endeavors to bring the so-called mental faculties together, and this by means of the principle of association. He rejects the notion that association accomplishes the *union* of mental

terms; for introspectively we find no connecting link—nothing but the fact of succession; and his standpoint forbids him to search for a connection outside of consciousness. For this reason he abandons the term association and substitutes Hobbes's term *suggestion*. But in general his view of the associative process conforms to Hartley's. The associated or suggested image is for Brown not a revival of the old sensation; it is a new experience. We can not explain it; we can only describe its appearance in consciousness by asserting that it is 'suggested.' But suggestion itself is based on the contiguity or contrast of similar experiences in the past.

Brown's attempted union of associationism with intuitionism was historically unsuccessful. It aroused the suspicion of both schools. This and his tedious prolixity lessened the influence which his system deserved on account of its exhaustive investigation of mental processes. He was the first to distinguish clearly between the primary and secondary laws of association—between the different *sorts* of union and the factors which determine its *quantitative* variation. In particular, his analysis of the secondary laws is remarkably complete, and his formulation of them is thorough, not to say redundant. He emphasized the 'mental chemistry' aspect of simultaneous association and his attitude seems to have influenced John Stuart Mill in adopting that view.

### 3. *The Two Mills and Bain*

James Mill viewed the human mind as a species of machine. It is set going by outside forces (sensory stimuli), and proceeds to operate as a physical mechanism. The machinery of the mind is the associative process, and the elder Mill conceives of this as acting like a physical force, mechanically. He makes no attempt to correlate the mental processes with the brain

processes as Hartley did, though his appreciation of the function of nerves and brain is clearly indicated and his attitude toward physiology is far more sympathetic than Brown's. His analysis of consciousness is introspective and in this he follows Brown. But his conception of association is totally different from the latter's. Brown regards association as a means of transforming simple experience into complexes, which differ in kind from their components. James Mill rejects the notion of transformation. He holds that the sole function of association is to bind experiences together, and that the complex states contain all the original elements intact. In successive association the passage from thought to thought is so rapid that often certain intermediate steps escape attention; in simultaneous association certain elements may be so obscure as to remain unnoticed, but the intermediate terms and the obscure elements are there nevertheless, and it only requires analytic examination to bring them to light.

An instance of such analysis is found in James Mill's examination of the notion of belief, which he finds associated with a host of different mental factors according to circumstance, but which is itself nothing more than an indissoluble association between the factors. Belief, or indissoluble association, is in fact a cardinal point in James Mill's system. In his view association does not reconstruct or modify the material, but it cements the separate elements together with a strong force, and by repetition this union at length becomes indissoluble. The complex fact *appears* to be simple; only psychological analysis proves that it is made up of a weft of elementary strands or a succession of separate steps.

This view of association enabled James Mill to analyze the higher mental processes, such as conception and reasoning, with better success than his predecessors. A concept is a cluster of ideas, reasoning is the association of

the terms of propositions. Each of these mental phenomena *seems* to be a single thing, but by psychological analysis it is shown to be really a composition. Taken in its entirety, Mill's analysis was far more thorough than any previous attempt, and his psychology is the first complete system worked out on an associational basis. Other associationists, however, raised strenuous objections to his instrument of research, and no one protested more vigorously than his own son.

John Stuart Mill was essentially a logician, and saw the logical fallacy of using introspective analysis to overthrow the validity of introspection. If introspection declares a certain experience to be simple, how can another introspection prove this introspection to be false? The way out of the difficulty appears plain enough to the younger Mill. It involves merely abandoning the mechanical view of association for the chemical analogy. According to him, association produces experiences which are really unitary, in the sense that they are not separable into parts by introspection. Introspection does not break the experience up into elements, as the elder Mill supposed, but it does reveal the elements which the act of association has brought together to form this new product. Association does more than unite—it transforms.

This revised view of the nature of association involved a restatement of nearly all of James Mill's analysis. But the restatement was not so difficult as might be imagined. In most cases the results could be accepted as they stood with merely the qualification that what James Mill considered *ingredients* in a complex experience are really its *antecedents*—that the resulting experience is not so much a complex state as a *derivative* state, which is introspectively as simple as it appears. Thus the perception of an orange or the concept *horse* are really simple, though derived from primitive elements. This line of argument

enabled the younger Mill to transform his father's system completely without duplicating the analysis. He accomplished the astonishing feat of giving to the world a psychology resting on a basis of his own construction, while using practically the entire superstructure which his father had built up on an altogether different foundation.

This procedure, while it resulted in a powerful system of psychology, proved a source of historic weakness. Later writers naturally regarded James Mill's original work as the principal element in the joint product. They have underestimated the value of J. S. Mill's reconstruction. James Mill's 'mechanical' interpretation of association came to represent associationism to the average student's mind, and the 'chemical' interpretation was generally considered a foreign branch grafted upon it; it was treated as something contrary to the genius of pure associationism. In the present volume the aim has been to show how mistaken is this attitude toward the theory on historical grounds as well as logically. The chemical view or something akin to it was held by many associationists before and after J. S. Mill, and these included some of the most vigorous analysts. The chemical interpretation belongs quite as much to the genius of associationism as James Mill's mechanical interpretation.

John Stuart Mill's greatest difficulty arose in accounting for belief. He inclined to the opinion that it contains some distinctive element which renders it primordially different from both sensation and ideation. In this of course he abandons the pure associational standpoint rather unnecessarily; for it was open to him to study the genesis of the element peculiar to belief and trace it so far as possible to familiar sources, as he attempted to do in the case of complex ideas. But the younger Mill's special interest was in logic rather than psychology. He was concerned only in correcting the logical fallacies in his father's psychological method and in outlining a psy-

chology which was fitted to serve as a basis for his own scheme of logic.

Bain's psychology is notable for its abandonment of introspection. He emphasizes the physiological concomitants of mental processes as Hartley had done; and in this he presents a sharp contrast to the Mills and Brown. But his physiology is far in advance of Hartley's, for the science had made vast progress during the intervening century. Brain activity was no longer conceived of as mechanical vibration, and the notion of diffusion of nervous impulses had arisen to account for the emotions. When physiology is emphasized it almost inevitably results in giving prominence to the motor side of the mental life. Thus Bain starts with sensibility and contractility of muscle as his two primary data, and a leading factor of his psychology is his study of impulsive and instinctive activity, the sense of effort, and other internal forms of motor phenomena. Moreover, Bain brings out a new connection between the mental and motor sides. Every sensation, he says, is accompanied by a tendency to movement, which grows in strength with the increased intensity of feeling. The motor tendencies of sensation being a legitimate object of psychological study, Bain's attitude justifies the investigation of physiological processes by association psychologists. In Hartley the reference to brain activity is rather an analogy brought in from another science. With Bain it admits of translation into psychological terms, and thus interpreted it forms an integral part of psychology.

The associative process is a fundamental element in Bain's system. He restates its laws and uses it as an instrument of research in every part of his analysis, especially in treating the intellectual processes; for association means revival of past mental states, and this revival always has an implied reference (if not an explicit one) to the restimulation of some trace of former brain ac-

tivity. The coordination of motor impulses into definite, specific movements results from the association of ideas with these motor elements and from the coordinated grouping of such ideas. And the crowning motor phenomenon, *volition,* is only the final step in this associative and coordinating process. In his later works Bain adopts Spencer's principle of relativity, but not his genetic system of mental organization. Had the advent of the evolution theory been delayed, it would seem as though Bain must have been the model for empirical analysis during the next generation. But events moved quickly, and almost before the revised edition of Bain's psychology was written it had passed into history. Bain's treatment of the motor side, indeed, had a marked influence on later writers. But his association theory was out of touch with the thought of the age. Evolutionists felt the need of a thorough re-examination of association in connection with the new theory, in which growth meant real transformation; while the opponents of evolution had no sympathy whatever with the association psychology. Bain therefore appears as the last of the 'pure' associationists. Those who follow him belong to another regiment, and march under another banner.

### *4. Spencer and Lewes*

The change in standpoint which the evolution concept introduced was further-reaching than one is apt to realize. It gave a totally different meaning to the world's history and thoroughly transformed the whole group of sciences which deal with life and human activity. We conceive today of a gradual perfectioning of organic forms from the dawn of life onward. We trace the progress of humanity from a state of ignorance and bestiality upward, instead of starting with an original condition of mental and moral perfection as pre-evolution thinkers

interpreted the beginnings of history. The legal, ethical, social, and religious institutions of mankind acquire a new meaning when we view them as a growth and as real progress. Even the study of language is transformed; it is no longer a science of mechanical inflections. Comparative philology shows how sounds have been transformed and how inflections have grown up; language is an evolution from crude beginnings by a quasi-vital process.

With this concept of 'real growth' in the air, it was difficult to regard the human mind from the old standpoint. The mind could no longer be conceived of as a *tabula rasa* at the birth of each individual, inasmuch as each individual inherits the entire race-history of his biological organism. The sense organs, nerves, and brain exhibit progress from species to species, and the mental life exhibits a distinct gradation of levels among the different species. Thus the vague phrase 'mental endowments' came to have a definite and scientific meaning. The human individual at birth, if he has inherited no actual experiences, has at least inherited certain organic capacities which make his experience, from the outset, different from those of the lower animals. Pre-evolutionary associationism was based on a mechanistic conception of experience; association was viewed as a mechanical or chemical process. It now became necessary to interpret association after the pattern of organic processes.

It has been urged by certain writers with some show of reason that the term *associationism* cannot properly be applied to the transformed doctrine; and one must grant that the term no longer holds without qualification. But the historian finds two reasons for retaining the old designation: First, the new school is a direct outgrowth of the older associationism—its historical successor. The two schools dovetail together; they belong historically to

the same movement and therefore deserve to be grouped together under the same name. Second, in the newer psychology the notion of association, though somewhat altered, still remains a dominant factor in the explanation of mental processes.

In SPENCER'S evolutionary psychology the nervous functions play a more prominent role than even Bain accorded them. Spencer does not identify experience with neural activity as some of his critics claim.[1] But he makes these physiological processes the pattern for the correlated psychological processes. He first investigates the processes of nerve physiology, and then translates them directly into psychological processes. The physical and mental being two sides of the same unknown reality, the laws of the former hold for the latter by merely substituting a different set of terms.

There are two prominent facts in the nervous life which interest psychologists: nerve impulse and nervous revivability. On the mental side the corresponding facts are feeling and association. Spencer formulates the conditions of nervous revival and transforms these conditions into laws of mental association. He differs with other associationists, however, in distinguishing between the *act of inducing* an associative mental state, which is for him the phenomenon of *mental association,* and the *relation* between the inducing and induced state, which he terms *relation of feeling*. The former experience is based on the neural phenomenon of revival or coherence; the latter is attributed to the shock which accompanies the passage from the old state to the new. His predecessors do not regard the 'relation' as a separate element of consciousness, nor as a distinct physiological phenomenon. For them the revival or production of the second experience

[1] He applies the term 'nervous shock' to the primitive form of experience, but in other respects he distinguishes the two sides very carefully. The word 'shock' itself is scarcely impeachable from the introspective standpoint.

carries with it the relation or union of elements and is part of the act of association; they recognize but one factor in the experience.

Spencer's theory on this point has led to a study, by William James and other writers, of the feelings of relation which accompany these relations of feeling. What interests us here, however, is that for Spencer the chief problem of association is the nature of the relations between feelings, as indicated by the physiological process involved. Spencer finds that every relation associates itself with similar relations experienced in the past, just as feelings associate themselves with similar past feelings. Hence, for Spencer the primary fact or law of association is *similarity*. Contiguity is subordinate; it is merely a repetition of the succession or coexistence which held among the original sensations. He finds, moreover, that consciousness as it grows complex tends more and more to take on the form of succession, while coexistence belongs rather to the physical side.[1] The degree or strength of associability among experiences depends on their vividness, on the amount of repetition, and on a third principle which he calls the law of decreasing gain.

Thus far Spencer conforms to the older associationism in spirit, in spite of his unusual interpretation of association. But his evolutionism appears when he transfers the nervous integration which underlies experience from the individual organism to the sphere of race history. The more fundamental nervous coherences are not formed in the lifetime of any individual; they are too deep-rooted for that. Biology indicates that, like all structures of the body, they have been gradually built up through many successive generations. Thus a difficulty of the older associationism was met. Many thinkers had questioned whether the well-nigh indissoluble associations

[1] Physical events are both simultaneous and successive according to Spencer.

which empirical psychologists find in experience could be built up through the comparatively few repetitions of similar experiences that occur during an individual's infancy. Doubt was thus cast upon the empirical solution. But the evolutionists argued that nervous structure is inherited, and that the anatomical connections which underlie association are built up in large measure prior to actual experience. Hence, they held that the conditions underlying association are inherited by the individual, though experience itself is not innate. The empirical position was confirmed by comparative neurology, which demonstrated that the underlying nerve structure involved in association has been gradually built up in the animal series.

Spencer is responsible for bringing associationism into accord with the Darwinian biology. But Spencer was not a trained psychologist. In reading him one feels his lack of sympathy with the psychological standpoint. In his writings mental phenomena appear to be merely biological processes clothed with a borrowed garment for modesty's sake. Psychology is treated as a child under tutelage, whose parent-science must always be consulted in matters of importance.

It is to Lewes, then, that we must turn for a sympathetic exposition of the revised theory. He believes mental phenomena to be worthy of study for their own sake; and his psychology, though based and rooted in physiology, is a mature science capable of holding property in its own right. Lewes reasserts the claim of introspection, which Spencer had abandoned almost altogether, as an instrument of research. He is also unique among associationists in emphasizing the social data of psychology, which he believes to be chiefly responsible for the tremendous growth of mind in man beyond other species.

Lewes denotes the primitive element of experience by

the term *neural tremor,* and regards sensation as a grouping together of these elements, while the higher types of experience are due in turn to groupings of sensations. This process of grouping, which Lewes also terms the *logical process,* is the association principle of earlier writers. But, like Spencer, he restricts the term association to one aspect of the grouping process: with him association is a purely adventitious grouping—one which has no basis in the connate mechanism. This would seem to exclude many important types of connection, such as the primitive spatial grouping of experiences. It harks back to Locke's view that association is a fortuitous or customary conjunction. The groupings which have a connate basis are more essential in Lewes's psychology than those which are brought about during the individual's lifetime. For the sake of historic unity, however, we may include all aspects of his so-called ' logical process ' under the traditional term *association.*

Lewes considers associations of sequence more important than those of coexistence, but gives the latter greater weight than Spencer had attributed to them. Simultaneous associations tend to become fixed, and the resulting complex group operates like a single unit. Thus the perception of objects as unitary experiences arises when several different sense-data combine. Lewes does not adopt the chemical analogy in describing these unions, like John Stuart Mill. But he lays emphasis on the *transforming* character of fusion, which gives a qualitative tinge to experiences.

Serial grouping or association also is responsible, according to Lewes, for some of the varieties observed in experience. It leads in the first place to the rise of imagery. When a large number of sensations are stimulated together, they cannot all be reinstated with their prior associations to the fullest extent; as a result, some are suppressed and only occur incipiently. Such incipient

reinstatements are representations or images. But a further step occurs: these images may be replaced by experiences of another sort, which bear no trace of the original sensations. Such experiences Lewes terms *ideas;* they include words and other associative factors which serve as signs for the image, though they do not resemble it.

Not merely the sensory and image-producing mechanism, but even the physical basis of ideas is too fundamental to have been wholly developed within the individual's lifetime. All these mechanisms are connate—that is, they are due to a structure which has evolved phylogenetically. Ideas, according to Lewes, are a social product, and their physical basis could only be evolved by generations of social life. The association of ideas is much readier and easier than the association of images, inasmuch as ideas are more general—in other words, less concrete and less specialized—than images. Association of ideas (in this technical sense) constitutes the intellectual side of experience, and hence the associational analysis accounts for intellectual phenomena as readily as for sensation and imagery.

Substitute the historic term ' association ' for Lewes's grouping or ' logical process,' and his psychology proves to be thoroughly associational; it carries out the associational analysis more completely than any of the preceding attempts.

Lewes suggests a plausible relation between sensation and affection, in the distinction which he carefully makes between external and systemic senses. He adheres to Spencer's treatment of instinct and impulse, which points to a psychophysical correlation between the motor side of the organism and experience; this results in a psychological concept of *conduct,* embodying the highest aspect under which mental phenomena may be viewed. It corresponds closely to the more recently adopted term *behavior.*

It remained only to apply Lewes's principles in a systematic manner, in order to construct a complete associational psychology. But this was never accomplished. Later British writers, such as Sully, Ward, and Stout, based their analysis on a modified intuitionism, while the experimental laboratory movement initiated by Fechner and Wundt in Germany brought to light a new method of research, and treated association as a minor factor to be investigated and analyzed psychophysically. Thus the work of the association school remained incomplete when the movement came to an end. The systematic study of the human mind along the lines indicated by Spencer and Lewes, which should have crowned their work, was never undertaken. As a result the world today appraises the association psychology only through the fragmentary attempts at analysis belonging partly to a bygone unscientific age, partly to the rudimentary stage of the evolution era.

### *5. Estimate of English Associationism*

The work of the English school as a whole extended along three different lines: (1) The formulation of certain laws according to which mental association proceeds. (2) The analysis of every sort of mental phenomena with a view to reducing them all, even the most complex, to the workings of the associative process. (3) The application of these results to the sciences of humanity, in an attempt to build up systems of ethics, logic, epistemology, jurisprudence, sociology, esthetics, and education in accordance with empirical principles.

(1) The first of these problems was recognized as important by many writers besides the associationists. Formulations of the laws of association were attempted by various psychologists not at all identified with the English school. On the other hand we find considerable

diversity of opinion within the school itself regarding these laws. As one would expect, the associationists made a more careful and thorough study of the associative principles than other schools. Nevertheless their discovery and formulation is not an achievement for which the association school can claim entire credit.

(2) The attitude toward the second problem is more characteristic of the school. Where others accepted certain mental powers as innate, or viewed certain experiences as simple data, the associationists sought to reduce mental function and structure to the lowest possible terms; they analyzed complex experience into simpler elementary data, joined together into real or apparent unity by the associative processes. In some cases the peculiarities of a given writer's view may be due to his philosophical standpoint. In other cases they appear as legitimate psychological alternatives.

With the progress of anatomy and physiology and the formulation of the broader biological laws, came the reconstruction of certain psychological interpretations along the line of better organic analogies. In all this the associationists played a leading part. The chief contribution of the school to the historical development of psychology consists in their analysis of complex and higher mental states into simpler and more fundamental. Their work in this field, however incomplete, is of lasting value.

(3) To study their third problem, the application of associative principles to other sciences, would carry us too far beyond the scope of this history. It should be emphasized, however, that the extension of associational principles to the various fields of mental and social science is an inevitable consequence of adopting the association standpoint. In fact, it was the search for empirical data adequate to account for the humanistic sciences that

really led most of these thinkers to adopt the association psychology. In all these sciences the association of ideas appeared to be the most adequate principle available for explaining the working of human mind. It would be scarcely correct to attribute utilitarianism and other phases of the empirical movement entirely to the influence of the association psychology; rather, the empirical trend of thought which originated with Locke manifested itself *both* in the association psychology and in allied, congruous movements in other sciences.

The motive which underlay the association movement was an endeavor to explain mental phenomena on an empirical basis. The system arose out of the attempt to combat the notion that certain ideas are innate—implanted in the mind at birth. But in the course of time the standpoint of both nativists and empiricists shifted. The nativists abandoned their theory of ready-made ideas, and claimed merely that the *forms* of experience are due to the intellect. The empiricists on the other hand were forced to admit that the primitive data of experience undergo transformation as they unite into complex forms.

A typical branch of nativists follow Kant in holding that the data of sensation are arranged by the mind itself in certain forms of time and space; these forms are native to the mind, but do not constitute experience—they do not of themselves appear in consciousness save in connection with the data furnished from without. The later associationists, on the other hand, hold that the temporal and spatial forms are themselves built up in connection with experience; they insist that the only 'native' data are the physiological dispositions of the brain which modify sensory impressions and transform them into a countless variety of central stimulations; the diversity of experience depends on the differentiation of these physio-

logical processes and not on any power native to the mind.

The adoption of the evolution theory had little direct effect on either of these positions. It only served to make the process of mental development more comprehensible, inasmuch as the underlying basis of association, whether mental form or physiological disposition, was now seen to have evolved through generations of individual lives, instead of being a character of the individual organism.

The nativist position rests on the assumption that mind is a substance or entity. The associationists regard each individual mind as consisting of many unit experiences, which are so firmly bound together in simultaneous groups and in one long train, that they constitute a unitary consciousness. By scientific examination (so-called 'introspective analysis') the elementary units may be attended to separately and their derivation and synthesis may be accounted for, the grounds of their rise, combination, and diversification being stated in terms of the physiological processes which accompany them.[1] Because it sought to split consciousness up into elementary states and laid special emphasis on the physiological basis, the association psychology has sometimes been termed a "psychology without a mind." It should be remembered, however, that the chief exponents of associationism recognized fully the unitary character of consciousness; the only basis for such criticism is that they regard the 'self' as a *product* of experience and not as the substantial and underlying *basis* of consciousness.

To sum up: (1) A cardinal point in the English movement is its hearty recognition of the *psysiological basis* of experience and its constant reference to the nervous functions in explaining the development of experience.

[1] Brown alone refused to consider these physiological laws a proper topic for psychology and merely stated the observed principles of psychological association.

(2) *Mental association* is accepted as the instrument whereby experience is fashioned into complex forms and serial trains; this associative process is viewed as depending on certain characteristics of brain activities. (3) Further, associationists generally recognize that a *transformation* occurs as a result of the associative union of experiences—that the product of such union is often qualitatively different from its elements. Some writers consider this a departure from the pure associational standpoint; but we have found that the theory in some form was accepted by practically all the English associationists except James Mill. It is in fact no more a departure from the genius of the associational analysis than recognition of qualitative diversity among the original sensations themselves.[1] These three postulates, together with the primitive datum of sensibility, constitute the working material of the association school.

We have observed how persistently these principles were used by the English writers in their attempt to explain all the phenomena of mental life. That the analytic examination was not carried out more systematically and completely was due to the fact that the associationists were one and all busily engaged in strengthening their foundations. Even Spencer and Lewes were forced to reconstruct the bases of their system in order to bear the added weight of the new evolution concept.

This task completed, it remained the duty of others to systematize the science along the lines laid down. But meanwhile the experimental laboratory method, starting

[1] It is interesting to note certain recent attempts (e.g. that of Professor E. B. Holt in his contribution to the 'New Realism') to derive the qualitative differences in sensation and other experience from homogeneous primitive units. The present writer believes that the 'mental chemistry' analogy furnishes a more plausible ground of explanation. Qualitative modification (or 'transformation') may be regarded as a primitive 'mental function,' of the same order as sensibility, revival, and association.

in Germany, was beginning to supersede the method of pure self-observation. Psychophysics, with its emphasis on quantitative results, came more and more into the foreground.

The quantitative measurement of mental phenomena gives greater precision than mere subjective analysis. But the two modes of investigation in reality supplement each other. Introspective analysis of the traditional associational type, united with quantitative measurements obtained by the newer experimental methods, have yielded notable results.

# BIBLIOGRAPHY

## A. History, Exposition, and Criticism of the Association Doctrine


Arnold, F. Psychology of Association (1906).

Baldwin, J. M. Dictionary of Philosophy and Psychology (1901).

Blakey, R. History of the Philosophy of Mind (1848).

Bower, G. S. David Hartley and James Mill (1881).

Claparède, E. L'association des idées (1902).

Coleridge, S. T. Biographia Literaria (1847).

Cousin, V. Philosophie sensualiste au XVIII^e siècle (5th ed. 1866).

Dewaule, L. Condillac et la psychologie anglaise contemporaine (1892).

Diogenes Laertes. Lives and Doctrines of Philosophers (A.D. 200 ca.).

Ferri, L. La psychologie de l'association (1883). [Cf. Italian original, 1878.]

Goblot, E. Le vocabulaire philosophique (1901); article on 'Association.'

Hamilton, Wm. Reid's Works: with notes (1846).

Höffding, H. Einleitung in die englische Philosophie unserer Zeit (1889).

Janet, Paul, and Séailles, G. Histoire de la philosophie (1887-8).

Kirchner, F. Wörterbuch der philosophischen Grundbegriffe (1886).

Lange, F. A. Geschichte des Materialismus (1866).

Lewes, G. H. History of Philosophy from Thales to Comte (1845-6; rev. 1880).

Mackintosh, James. Dissertation on the Progress of Ethical Philosophy (1831).

Morell, J. D. Speculative Philosophy in the 19th Century (1846; rev. 1858).

Morris, G. S. British Thought and Thinkers (1880).

Ribot, T. A. Psychologie anglaise contemporaine (1870; 2d ed. 1875).

Robertson, G. C. Association of Ideas. [Art. in 'Encycl. Brit.' 9th ed. and 11th ed.]

Stephen, I. English Thought in the 18th Century (1876).

Sollier, P. Essai sur l'association en psychologie (1907).

Stout, G. F. Associationism and Association of Ideas. [Art. in Baldwin's 'Dictionary of Philosophy and Psychology' 1901.]

Ueberweg, F. History of Philosophy (1862; several editions).
Villa, G. La Psicologia contemporanea (1899).
Windelband, W. Geschichte der neueren Philosophie (1890-92).

### B. Ancient and Medieval Contributors (to 1650)

Aristotle [B.C. 384-322]. De anima, bk. II, ch. 12; bk. III, ch. 2-4.
——— Parva naturalia: De sensu, ch. 1, 4, 7; De memoria et reminiscentia, ch. 1, 2. [See esp. De mem., ch. 2, sec. 611.]
Augustine [L. Aurelius Augustinus; A.D. 354-430]. Confessions, bk. X, sec. 13, 14, 28.
Carneades [B.C. 213 ca.-129]. See Sextus Empiricus, Adv. Math., bk. VII, sec. 176.
Chrysippus [B.C. ca. 281-208]. See Diogenes Laertes, bk. VII, 'Zeno,' sec. 36.
Descartes, René [A.D. 1596-1650]. Traité de l'homme (posthumous).
Epicurus [B.C. 342-270]. See Diogenes Laertes, bk. X, sec. 21.
Plato [B.C. 427-347]. Phaedo, sec. 73-6.
Vives, Juan Luis [A.D. 1492-1540]. Commentary on Aristotle's De anima, bk. I, and bk. II, ch. De mem.
Zeno of Cittium [ca. B.C. 342-264]. See Diogenes Laertes, bk. VII, sec. 28, 36, 52.

### C. The British Associationists

Alison, A. [1757-1839]. Essays on the Nature and Principles of Taste (1790).
Austin, J. [1790-1859]. Lectures on Jurisprudence (posthumous).
Bailey, S. [1791-1870]. Review of Berkeley's Theory of Vision (1842).
——— Letters on the Philosophy of the Human Mind (3 series, 1855, '58, '63).
Bain, A. [1818-1903]. Senses and Intellect (1855).
——— Emotions and Will (1859).
——— Mind and Body (1866).
——— Mental Science (1868).
——— Notes in James Mill's 'Analysis' (1869 ed.).
——— Logic (1870).
Baxter, A. [1686-1750]. Enquiry into the Nature of the Human Soul (1730?).
Belsham, T. [1750-1829]. Elements of the Philosophy of the Human Mind (1801).
Belsham, W. [1752-1827]. Essays Philosophical and Moral (1794).
Bentham, J. [1748-1832]. Principles of Morals and Legislation (1789).

Berkeley, G. [1685-1753]. Essay towards a New Theory of Vision (1709).
——— Treatise concerning the Principles of Human Knowledge (1710, 1734).
——— Dialogues between Hylas and Philonous (1713).
——— New Theory of Vision Vindicated (1733).
Brown, T. [1778-1820]. Lectures on the Philosophy of the Human Mind (1820).
Browne, P. [ca. 1665-1735]. The Procedure, Extent and Limits of the Human Understanding (1728).
Collier, A. [1680-1732]. Clavis universalis (1713).
Collins, A. [1676-1729]. Essay concerning the Use of Reasoning in Propositions (1707).
Cumberland, R. [1631-1718]. De legibus naturae (1672).
Darwin, E. [1731-1802]. Zoonomia (1794).
Dodwell, H. [1641-1711]. De veteribus graecorum romanorumque cyclis (1701).
Gay, J. [1699-1745]. Dissertation on the Fundamental Principle of Virtue. (Preface to Archbishop King's 'Origin of Evil,' trans. by Archdeacon Law).
Gerard, A. [1728-1795]. Essay on Taste (1758).
Hamilton, Wm. [1788-1856]. Lectures on Metaphysics (1859-60). [Law of Redintegration, in Lecture 31.]
Hartley, D. [1705-1757]. Conjecturae quaedam de sensu, motu et idearum generatione (1731?). [Reprinted 1837 by Parr in 'Metaphysical Tracts by English Philosophers of the 18th Century.']
——— Observations on Man, his Frame, his Duty, and his Expectations (1749).
Hobbes, T. [1588-1679]. Human Nature (1650).
——— Leviathan (Engl. 1651; Latin, 1668).
Hume, D. [1711-1776]. Treatise on Human Nature (1739).
——— Enquiry concerning Human Understanding (1748).
Lewes, G. H. [1817-1878]. Problems of Life and Mind (1875-77).
Locke, J. [1632-1704]. Essay concerning Human Understanding (1690).
Maine, H. J. S. [1822-1883]. Ancient Law (1861).
Mandeville, B. de [1670-1733]. Fable of the Bees (1705).
Martineau, J. [1805-1900]. Essay on Priestley (1866).
Mill, James [1773-1836]. Analysis of the Phenomena of the Human Mind (1829).
Mill, J. S. [1806-1873]. Logic (1843).

——— Examination of the Philosophy of Sir William Hamilton (1865).
——— Notes in James Mill's 'Analysis' (1869 ed.).
Morell, J. D. [1811-1891]. Elements of Psychology (1853).
——— Introduction to Mental Philosophy (1862).
Murphy, J. J. [1827-1894]. Habit and Intelligence (1869).
Priestley, J. [1733-1804]. Examination of Dr. Reid's Inquiry . . . and Dr. Oswald's Appeal to the Principles of Common Sense (1764).
——— Letters on Materialism and Hartley's Theory of the Human Mind (1775).
——— Disquisitions relating to Matter and Spirit (1777).
Smith, A. [1723-1790]. Theory of Moral Sentiments (1759).
——— On the External Senses (1795).
Spencer, H. [1820-1903]. First Principles (1862).
——— Principles of Psychology (1855, rev. 1870).
Tucker, A. [1705-1774]. The Light of Nature Pursued (1768).
[Anon.] An Enquiry into the Origin of Human Appetites and Affections, etc. (1747). [Attributed to John Gay.]
[Anon.] Essay on the Nature and Existence of the Material World (1781).

# VITA

HOWARD C. WARREN, the author of this dissertation, was born at Montclair, New Jersey, June 12, 1867. His earlier education was received at small private schools and under the private tutoring of Charles M. Davis of Bloomfield, New Jersey. In 1885 he entered the College of New Jersey (Princeton), from which he was graduated in 1889 with the A.B. degree. From 1889 to 1891 he pursued graduate studies in mathematics and philosophy at Princeton, holding the C. G. Mental Science Fellowship during the former year, and serving as instructor in Logic during the latter. In 1891 he received the degree of A.M. at Princeton. From 1891 to 1893 he pursued graduate studies at the universities of Leipzig (2 semesters), Berlin (1 semester), and Munich (1 semester).

In 1893 he was appointed Demonstrator in Psychology at Princeton University (then the College of New Jersey), and pursued graduate studies for the doctor's degree till February, 1896, when he was appointed Assistant Professor of Experimental Psychology at Princeton University. In 1902 he was appointed Professor of Experimental Psychology in the same institution, and in 1914 Stuart Professor of Psychology. In October, 1916, the title of Director of the Psychological Laboratory was added. In the fall of 1916 he enrolled at the Johns Hopkins University as a graduate student in Psychology, with Philosophy and Education as subordinate subjects, receiving a fellowship by courtesy.

In 1895 the writer assumed the annual compilation of the *Psychological Index,* which he continued (excepting two years) till 1915. In 1902 he was made associate editor of the *Psychological Review,* and in 1904 became

co-editor, with editorial charge of the *Psychological Bulletin,* which he retained till 1910. In 1911 he became senior editor of the group of Psychological Review Publications, with editorship of the *Index.* In 1916 he assumed the editorship of the *Review.*

The writer's publications on psychological and cognate lines to 1917 include the following (omitting reviews, reports, translations, and discussions):

"Sensations of Rotation." (*Psychol. Rev.* '95)
"Further Experiments on Memory for Square-Size." (With W. J. Shaw. *Psychol. Rev.* '95)
"The Reaction Time of Counting." (*Psychol. Rev.* '97)
"The Fundamental Functions of Consciousness." (*Psychol. Bull.* '06)
"Hedonic Experience and Sensation." (*Psychol. Bull.* '08)
"'Magnetic Sense' of Direction." (*Psychol. Bull.* '08)
"The Form of the Color Pyramid." (*Psychol. Bull.* '10)
"The House of Childhood." (*J. of Educ. Psychol.* '12)
American Psychological Association: Report of the Committee on the Academic Status of Psychology. (Compiled and written by H. C. Warren.) Princeton, N. J., Falcon Press, 1914. Pp. 27.
"The Mental and the Physical." (*Psychol. Rev.* '14)
"A Study of Purpose." (*J. of Phil., Psychol., etc.* '16)
"Mental Association from Plato to Hume." (*Psychol. Rev.* '16)
"Apparatus and Experiments for the Introductory Course." (*J. of Exp. Psychol.* '16)
Contributions to 'Baldwin's Dictionary of Philosophy and Psychology.' (ca. 1901)
Contributions to 'Johnson's Universal Cyclopedia.' (ca. 1900)

In 1911 the writer was elected to the Council of the American Psychological Association, serving two years. In 1913 he served as president of the Association.